ELECTRICAL SOUTH

Serving the 16 Southern and Southwestern States

Electrical heating proves practical for office building — See page 30

SEPTEMBER, 1954

COMPARE . . .

ortho-77

Reg U S Pat Off Applied For

with any conventional fixture

TRADE MARK . . . PATENT APPLIED FOR

	Ortho-77	Conventional
OVERALL COST	Reports show savings up to 50% in installation costs with the Ortho-77, which means that you can buy the Ortho-77 *installed* for the same price as ordinary fluorescent fixtures.	Installation costs of ordinary fluorescent fixtures average nearly *twice* that of comparable Ortho-77 installations. Although initial costs are in some instances lower, the overall installed cost of the Ortho-77 is favorable.
INSTALLATION	Uni-race sections can precede fixtures to the job. Easily and quickly mounted, they assure positive, permanent straight alignment automatically. Fixtures may be shipped when the building is ready for occupancy and can be hung without tools in minimum time.	In conventional installations, heavy fixtures often must be handled many times on the job. Permanent alignment is frequently difficult to maintain without accessories. Because of the tools and handling necessary, it is difficult to keep fixtures clean in mounting.
FLEXIBILITY	Fixtures of same wattages are interchangeable on the same Uni-Race. Lighting levels can be raised from two to four lite in a matter of minutes, or fixtures can be mounted at spaced intervals and made continuous anytime later without tools in a minimum of time.	Conventional fixtures offer virtually no flexibility in so far as fixture interchange or change of lighting layout is concerned.
MAINTENANCE	Ballast replacement can be made in a matter of minutes by changing fixtures instead of parts. Repairs can be made in the shop at will and service on the line will not be interrupted *even while changing fixtures.*	With conventional fixtures, it is necessary to suspend service on the entire circuit to make repairs. Frequently the working area is disrupted for several hours while this is being accomplished.

WRITE TODAY for descriptive folder giving details of the Ortho-77

GIBSON Manufacturing Co.

1919 PIEDMONT CIRCLE, N. E.

ATLANTA, GEORGIA

GET LOWEST INSTALLED COSTS . . . EVERY TIME . . . WITH

GEDNEY CONDUIT BODIES

MALLEABLE IRON—HOT DIP GALVANIZED

YOU CAN'T HELP but cut installation costs with Gedney Conduit Bodies. Every one of them is accurately machined and threaded . . . smooth finished . . . made of unbreakable malleable iron . . . inspected for complete perfection. On top of that, they're special hot dip galvanized to assure absolutely top life on the job . . . and they come in all types and sizes from ½" to 4".

AMONG GEDNEY'S COMPLETE LINE ARE:

TYPE LB—Threaded—for heavy wall rigid conduit. Used with Gedney entrance fittings, straps, clamp backs, etc., you get an *entire* conduit system with hot dip galvanized finish.

TYPE FS—Threaded—shallow bodies for heavy wall rigid conduit. Only Gedney gives you hot dip galvanized as standard finish . . . no corrosive deposits on threads to slow down work and hike costs.

NO MATTER WHAT your requirements may be, there's always the right Gedney body and fitting for the job. To cut installation time and costs and assure long-run dependability, specify Gedney, always.

GEDNEY FITTINGS FIT

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ELECTRIC COMPANY

GEDNEY

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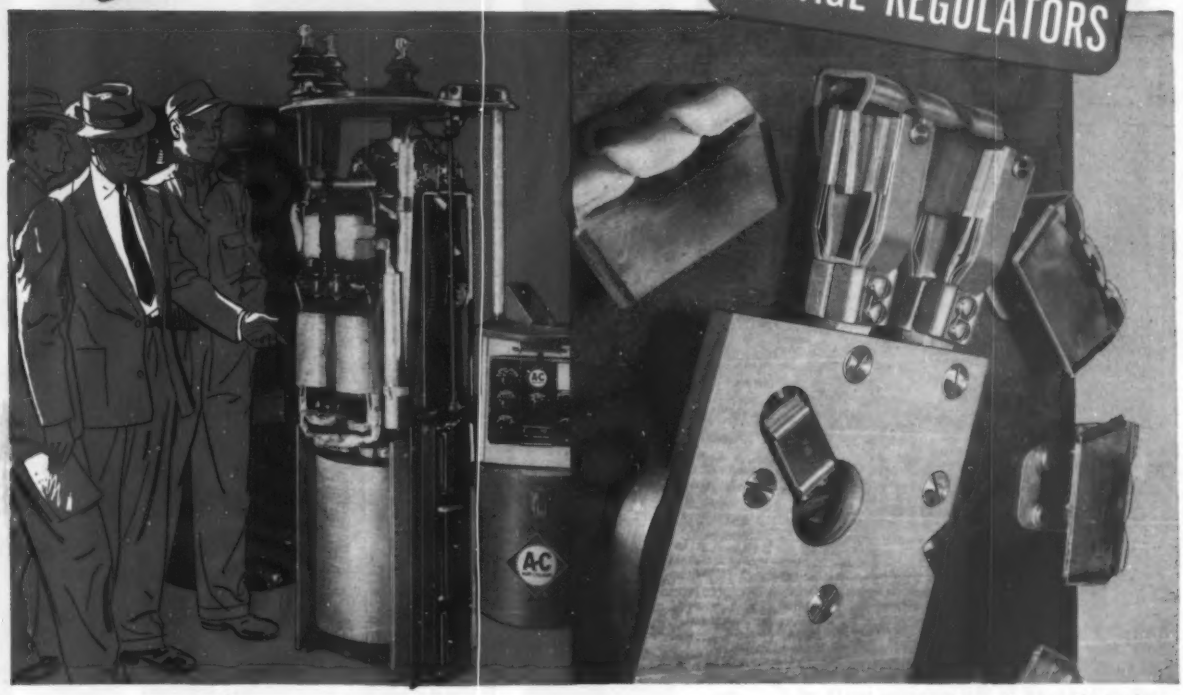
Volume 34 Number 9

We furnish the regulator . . .

You make the test!

ALLIS-CHALMERS
5/8% STEP VOLTAGE REGULATORS



Close examination shows all the facts. For example, a close-up view of the dial switch shows wired boltheads—another reason A-C regulators give you long life with little maintenance.

Any recognized distribution system can get an Allis-Chalmers Type JFR distribution regulator for thirty days of thorough examination completely free of charge. Allis-Chalmers helps you decide for yourself because experience has shown that complete tests on your home grounds will prove to your engineers, purchasing people, operating and maintenance men that your system will get the most for its regulation dollar from an Allis-Chalmers distribution regulator.

HERE'S WHAT YOU'LL SEE . . .

You'll see how easy it is to untank an Allis-Chalmers distribution regulator — why field service is simplified and speeded by its field-tested design. You'll see the "tool engineer's quality" designed into the mechanism — why you can count on years of satisfactory service with little or no maintenance. You'll see the large contacts made of arc-resisting material that have operated for over a decade on utility systems with no appreciable signs of wear.

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Your nearby A-C office will help you get a regulator and the recently published "regulator check list," or you can write Allis-Chalmers, Milwaukee 1, Wisconsin. Get a regulator on your own home grounds and get the real inside story of how good a regulator can be.

A-4354

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ORIGINATORS OF 5/8% STEP REGULATION

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ELECTRICAL SOUTH

SERVING THE 18 SOUTHERN AND SOUTHWESTERN STATES

September, 1954 — Vol. 34—No. 9

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TO HELP THE BUSY READER—

At a cost of $3.33 per month, an enterprising Texas contractor has solved one of his major problems by building a **portable take-down material house**, which he transports from one construction job to another with amazing advantages. For details on how the house is constructed and used, see **page 20.**

Aluminum is gaining considerable headway as a material for electrical conductors, both in the field of transmission and insulated electrical power conductors. Supply prospects and the material's economic position indicate that **aluminum conductor terminating techniques** are fast becoming a subject of considerable importance. Newest practices are discussed in the article on **page 26.**

Many problems confronted the contractor who undertook to install **wiring in the windowless building** of Burdine's department store in Jacksonville, but his successful application has proved that the job can be done with distinct advantages to the owner of the building. **See page 18.**

With the influx into the market of air conditioning equipment in the past several seasons, and the lack of uniformity of rules regarding its installation, an **interim amendment on air conditioner wiring** has been placed in the National Electrical Code. **See page 42.**

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FIXTURES
and
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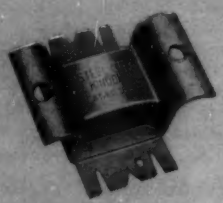

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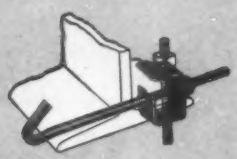

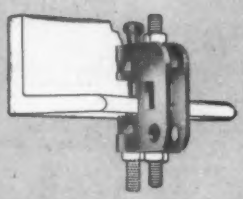

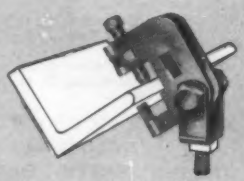

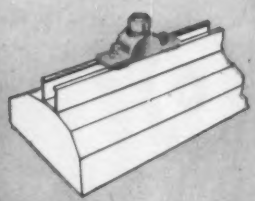

KINDORF CHANNEL CLAMPS and HANGERS

Economic comment

by J. Whitney Bunting, Ph.D.

Retail sales optimistic

◆ THE MOST ENCOURAGING sign of the entire economic picture as summer operations draw to a close is the extremely healthy situation found in retail sales for small and large stores alike. Across the nation this trend is marked, and with few exceptions the volume of store sales remains consistently high. This is even more true in the South where sales gains have led most of the nation.

Generally the summer season with its relatively hot and uncomfortable temperatures does not produce a great interest in retail shopping. Suburban stores with late evening shopping usually do alright, but the downtown specialty and department stores frequently find summer heat a depressant for sales. Not so this year. Cash registers continue to work overtime, and buyer confidence seems to have wiped away the general public apathy to summer buying. Moreover, this has been a great help to industrial production and business volume.

The public, and business leaders, too, seem to feel that this is as good a time as one can expect for buying merchandise of all types. Autos are moving briskly as well as appliances, furniture, household equipment, and apparel. Food purchases are high and even coffee, at a fabulously expensive price per pound, is still a big item on the family table or across the luncheonette counter.

Saving—but not hoarding

People are saving, yes, but they are not hoarding as they did a few brief months ago. Money is still going into all fields of investment and into bank accounts of various types. Money already saved or invested remains consistently in the same place. But the general upsurge of personal incomes and the growing confidence in business stability have convinced the public that it is wise to also acquire some of the consumer goods necessary to the maintenance of good living standards.

Since the nation is about to emerge into the regular fall and winter buying period that will be capped by the Christmas season, retail merchants can feel confident that 1954 will have been a good economic year. While it seems very unlikely that the fall season will be unusually high, after summer records have been considered, retail sales to the end of the year must remain fairly brisk as a normal feature of the economic picture.

There is ample evidence about, however, that plans should be laid well in advance for bigger and more intensive sales personnel training programs at the retail level. The results of an adequate sales training program are not felt immediately. It takes some time for the principles learned to be put into practice. Thus, if good employees are to be made better, and, if fair employees are to be transformed into valuable selling assets, now is the time for retail management to reactivate their training programs.

Automobile consolidations

The new trend in automobile mergers is really an old trend returning in a more spectacular fashion. For some time now it has been indicated that many old line, independent auto manufacturers would have to resort to merger or consolidation in order to stay in business. The stranglehold on automobile sales held by the big three (Ford, General Motors and Chrysler) has indicated that the only solution for the small companies was to become big and varied in their operation.

The latest consolidation, that of Packard and Studebaker, brings together two of the oldest automobile producers in the nation. Yet these two, with excellent reputations for motive power and styling, have found themselves with less and less of the market in contrast to the progress of the Big Three.

Complete line advantage

America learned some years ago that the strong manufacturer is the one with a varied price line and with numerous models from which the consumer can choose. One finds that a General Motors customer may work through various G.M. brands (such as Chevrolet, Pontiac, Oldsmobile, Buick and Cadillac) as both family and income register changes. Heretofore, the independent manufacturers, restricted by productivity and capitalization, have been unable to offer such choices. Thus they have tended to lose a good deal of the "shopper's market."

The merger of Packard and Studebaker, although not the complete answer for all of the ills of either company, will provide additional models and styles for selection, and will offer greatly expanded capitalization that may produce stability of operations.

As the situation stood just before this merger, the capital structure of each company was being undermined by annual operating losses. This seriously curtailed possible efforts for the development of an adequate merchandising program to cultivate consumer goodwill.

The previously announced Kaiser-Willys and Hudson-Nash combines had much the same reasoning behind them. However, their opportunities for success in achieving desired goals do not appear as bright as for the Packard-Studebaker merger. Their combination does not offer the consumer the needed stimulant for large scale buying.

Dr. Bunting, well-known southern economist, is president of Oglethorpe University, Oglethorpe Univ., Ga.

for the best in Time Switch Performance:

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Unfailing on-off control . . . that's what you get when you specify Sangamo Heavy Duty Time Switches. No detail has been overlooked to offer you a time switch which represents the utmost in accuracy, sturdiness and dependability.

Sangamo Heavy Duty Time Switches are available for almost any conceivable application from the simplest on-off operation —to complex multi-operation schedules.

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3. **Available with Automatic Carryover and Astronomic Dial.** Automatic carryover assures continued operation for up to 10 hours in event of power failure. Astronomic dial controls switching schedule in accordance with sunrise and sunset . . . and compensates daily for the progressive changes in seasons.

Have you tried the Low Priced Type B?

Here's a time switch with high Sangamo *quality* at a new, low price . . . a switch you can install and forget . . . a switch that will go on working without constant attention.
It has the same low-speed, hysteresis motor with the same maintenance-free features as the heavy duty model.

The Sangamo Type B wipes out the service headache. When you install it, you're spared the wasted expense of call-backs due to motor failure, jammed levers, burned contacts or stuck dials.
Sturdy, attractive, all-steel case with hinged cover and sealable hasp . . . anyone can operate it . . . installs easily—case is designed so there's wiring room in almost half the inside space . . . ½" to ¾" multiple knockouts . . . NEMA Standard 30 ampere rating . . . single pole, single throw construction . . . long life solid silver contacts and bronze bearings at points of greatest wear.

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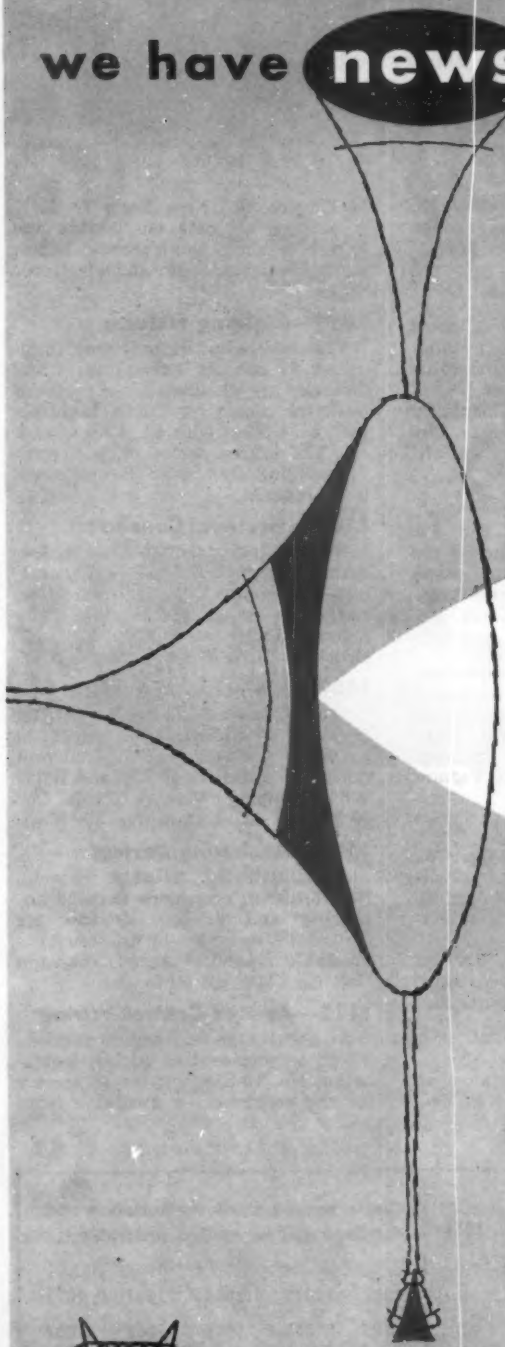
SANGAMO ELECTRIC COMPANY

SPRINGFIELD, ILLINOIS

ST34-4

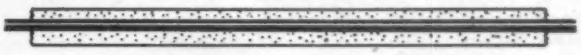
we have news for you . . .



Neoprene covering for wire and cables is not new, of course, but Southern Electrical Corporation's Neoprene-covered wire and cables make big news, because we are the first wire-mill in the south to manufacture wire and cables covered by Neoprene made under Western Electric Company's new and greatly improved method of room temperature extrusion.

Western Electric has proved that to be trouble-free, Neoprene-covered wire must be processed under controlled conditions. The faults in Neoprene produced under old methods are eliminated under this new method as illustrated below.

Here is probable structure of Neoprene Jacketing as made under other methods. Note the number of inclusions (in red.) These inclusions cause electrical breakdowns.



Here is Neoprene Jacketing as we make it, under WESTERN ELECTRIC COMPANY'S Room Temperature Extrusion Method. Note the absence of inclusions.

Also this improved process further increases the inherent superiority of Neoprene Coverings in resistance to:

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1011—Electrical Conduits

"Natural Electric Conduits" is the title of the 30-page Catalog No. 603 which describes and illustrates the many types of electrical conduits that are manufactured by National Electric Products Corp., 2 Gateway Center, Pittsburgh 22, Pa.

1015—Squeezon Connectors

The Squeezon, a new compression connector for power lines, is fully described in bulletin "SQ" available from the James R. Kearney Corp., 4236 Clayton Ave., St. Louis 10, Mo. The Squeezon features greatly increased electrical and mechanical efficiency.

1019—Service Panels

Information on protective electrical control centers for homes, apartment buildings, service stations, and industrial applications is contained in Bulletin PM-355, "BullDog Pushmatic Electric-Centers," issued by BullDog Electric Products Co., 7610 Jos Campau, Detroit, Mich.

1051—Transformers

"Care and Maintenance of Marcus Dry Type Transformers" manual No. M-100 goes into a complete description of the proper method of installing dry type transformers, particularly Class B, in all of the sizes which they are available today. Marcus Transformer Co., Inc., P. O. Box 551, Rahway, N. J.

1071—Plugs and Receptacles

Additional loose-leaf sheets for insertion in the Pylet Catalog 1100 are available from the Pyle-National Co., 1354 N. Kostner Ave., Chicago 51, Ill. These pages describe a wide range of plugs and receptacles for special purposes.

1079—Washer Lugs

Krueger and Hudepohl, 3 E. Third St., Cincinnati 2, Ohio, in their Bulletin 8-DF, give information and catalog listings for their complete line of K&H solderless terminal folding double cupped washer lugs. The folder explains uses and applications of all the lugs.

1081—Busduct Data

Various applications of the FA busduct for industrial purposes are illustrated in this bulletin made available by the Frank Adams Electric Co., P. O. Box 357, St. Louis, Mo.

1085—Lighting Fixtures

Eastern presents their most complete catalog, 32 pages of engineered lighting data, including a variety of fixtures for all architectural, commercial and industrial applications. Eastern Fixture Co., Inc., 170 Vernon St., Boston 20, Mass.

1087—Fittings Catalog

The M. & W. Electric Mfg. Co., Inc., East Palestine, Ohio, has available their new 28-page catalog 53, covering Service Entrance Mast Fittings, Service Entrance Cable Fittings, Ground Clamps, Rods, BX and Romex Connectors, Conduit Fittings, Wireholders, Insulator Supports and Cable Racks.

1097—Cord Catalog

A complete 48-page catalog is available from the Cornish Wire Co., 50 Church St., New York 7, N. Y. containing all data on flexible and portable cords, lamp cords, heater cords, cordsets, radio and electronic wires.

1099—Lighting Fixtures

Fluorescent and incandescent luminaires for schools, offices, stores and factories are illustrated in a series of bulletins issued by Curtis Lighting, Inc., 6134 West 65th St., Chicago 38, Ill. The entire series or any individual bulletins may be obtained upon request.

1103—Electrical Connectors

Burndy Industrial Catalog 52, featuring a complete line of general-purpose connectors for industrial wiring is available. Published by Burndy Engineering Co., Inc., 107 Bruckner Blvd., New York 54, N. Y.

1107—RW and RHW Wire

"The Ampere Squeezer," a booklet explaining visually the effect of ambient temperatures on current carrying capacities of RW and RHW Wire. Simplex Wire & Cable Co., 79 Sidney St., Cambridge 39, Mass.

1109—Anchoring Devices

An illustrated 32-page catalog, No. 65, describing more than 25 anchoring and drilling devices for making fastenings to masonry, is available from the Arro Expansion Bolt Co., Marion, Ohio.

1115—Remote-Control Wiring

An eight-page, non-technical booklet on remote-control wiring, publication No. 16-330, written expressly for the consumer, is available from

ELECTRICAL SOUTH
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September, 1954

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1165	1167	1169	1175	1177
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1195	1197	1199	1201	

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11,000 ft of 1½" Spang Conduit have gone into the ceiling slab for 426 regular and emergency tunnel lighting outlets. 8,080 ft of 3½" *top-quality* Spang are being used in one tunnel wall for high tension feeders.

Spang Conduit is easier to cut, thread, bend and weld, because the manufacture of Spang is *quality-controlled* throughout. Each length is tested and inspected before shipment.

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Electrical Subcontractor:	Barnes and Brass Electric Co., Clarksburg, W. Va.
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1117—Air Cooled Fixtures

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1131—Fluorescent Units

Fluorescent Units for Slimline Lamps. This new, illustrated, 20-page bulletin gives complete specifications of general purpose, "Magna-Flo" lighting systems for 96, 72 and 48-inch, T12 Slimline lamps. Write Benjamin Electric Mfg. Co., Des Plains, Ill., and ask for bulletin "mf."

1133—Vaportight Fixture

New Appleton "V-51" Series Convertible Vaportight Lighting Fixture is fully described and illustrated, for pendant, ceiling or bracket mounting, with or without reflectors and guards. Bulletin 5-A, 24 pages. Appleton Electric Co., 1701-59 Wellington Ave., Chicago 13, Ill.

1135—Wiring Devices

Catalog No. 51, containing complete electrical wiring device line of Leviton Mfg. Co., Brooklyn 22, N. Y., is a 96-page thoroughly illustrated one. Included are such features as the Kwik-change line, with wiring diagrams, a general index, and an index to catalog numbers.

1149—Insulator Catalog

Victor Insulators, Inc., Victor, N. Y., has available a complete catalog of Victor high, medium and low voltage insulators and line hardware. Complete contour shapes, dimensions, specifications and engineering data are included. Write for Bulletin No. 4 or use reply coupon.

1151—Circuit Breakers

A concise and well-illustrated 28-page catalog, No. C. B. 1000, on the new Stab-Lok Circuit Breaker System has been announced by Federal Electric Products Co., 50 Paris St., Newark 5, N. J. Advantages of the system comprise headings under which are listed complete specifications.

1153—Wiring Devices

A new catalog issued by Clyde W. Lint Co., 2323 West 18th St., Chicago 8, Ill., discusses details of the company's line of tools and electrical wiring devices, pole line hardware, and standard porcelain.

1155—Wire and Cable

Two catalogs—Bulletin RS-5, and Power and Control Cables, No. 24—available from Rome Cable Corp., Rome, N. Y. Power and Control Cables catalog is intended for utility, construction, and industrial engineering and purchasing personnel as a guide in selection of proper wire and cable types.

1157—Transformers

Dongan Electric Mfg. Co., 2998 Franklin, Detroit 7, Mich., has brochures available on its various types of transformers, including power circuit, control, signaling, machine tool, ignition and neon transformers.

1163—Connection Methods

A 20-page booklet illustrating practical and proved methods of making good connections with aluminum conductor, especially in distribution lines and service drops. Available in any quantity desired free of charge from Kaiser Aluminum & Chemical Sales, Inc., 1924 Broadway, Oakland 12, Calif.

1165—Ceiling Heating

"Sunwarm Electric Radiant Heating Cables." Complete information on ceiling radiant heating with Sunwarm radiant heating cables, including approved installation methods, available by writing Sunwarm, Inc., Box 263, Kingsport, Tenn.

1167—Industrial Lighting

A four-page catalog insert is now available from the Multi Electric Mfg. Co., Inc., 4223-43 West Lake St., Chicago 24, Ill. The leaflet describes Multi's line of lighting equipment and wiring devices, which include floodlights, vaporproof fixtures, and fluorescent and incandescent fixtures.

1169—Lighting Fixtures

Fluorescent and slimline luminaires, for schools, offices, stores, etc. Illustrated in the new catalog issued by Sta-Brite Fluorescent Mfg. Co., P. O. Box 6352, Miami, Fla., may be obtained upon request.

1175—Slimline Fixtures

The Light and Power Utilities Corp., 1035 Firestone Blvd., Memphis, Tenn., has recently issued a new catalog describing its line of fluorescent and slimline lighting fixtures. Typical installations of the fixtures are shown and discussed.

1177—Portable Furnaces

A new eight-page folder has been issued by Meier Electric and Machine Co., Inc., 3525 East Washington St., Indianapolis, Ind., giving descriptive information on the company's line of small electrical heating units. The booklet explains how the equipment may be used as primary or auxiliary heat.

1183—Electrical Equipment

The Wadsworth Electric Mfg. Co., Inc., Covington, Ky., has issued a new catalog Con 15-0 and Bulletin W. C. B. 53-1, containing data on their lines of Safety Switches, Service Equipment Distribution Panels and "E-Z-RED" Circuit Breakers.

1187—Fans and Blowers

Complete information on Peerless Electric Company's fans and blowers is available in illustrated Catalog SDA-160. Detail drawings, product specifications and rated capacities are included. The Peerless Electric Co., W. Market St., Warren, Ohio.

1189—Air Conditioners

Complete Line Folder—CL-54—covering Remington's "Tropic-Tested" line of both Window and Console Model Air Conditioners. Several exclusive features have been produced by Remington Air Conditioning Div., Auburn, N. Y.

1191—Control Centers

Colorful 24-page booklet by The Clark Controller Co., 1146 E. 152nd St., Cleveland 10, Ohio, describes advantages of Centralized electrical control systems through use of a-c Motor Control Centers. Typical installations, specifications and planning pits are featured.

1193—Cooling Equipment

Signal Electric Mfg. Co., Menominee, Mich., has recently issued its 1954 catalog which features the company's complete line of window, pedestal, desk, and oscillator fans. The new color book gives descriptions, features and specifications for each of the company's products.

1195—Kitchen Ventilation

Descriptive eight - page folder, Bulletin 620H, showing typical installations of all models in the Clipper line of ventilators is available from Trade-Wind Motorfans, Inc., 5725G S. Main St., Los Angeles 37, Calif. Folder includes dimensional drawings of installations helpful to building and electrical contractors.

1197—Convenience Outlets

Four-page bulletin gives complete information on the new P&S No. 500 for adding extra outlets to existing installations. Everything you need in a single package—no steel boxes required. Available from Pass & Seymour, Inc., Dept. ES, Syracuse 9, N. Y.

1199—Volt-ammeter Catalog

Amprobe Catalog No. 134 shows a complete line of snap-around volt-ammeters. Available from Pyramid Instrument Corp., Lynbrook, N. Y., the catalog includes detailed specifications and features of three high-voltage Amprobe Junior models for industrial use; four Amprobe Junior models for electricians and service men; new Amprobe Energizer.

1201—Loom Switch

Entirely new design fully described in an 8-page circular by The Arrow-Hart & Hegeman Electric Company, Hartford 6, Conn. Features fully enclosed, vibration-resistant mechanism; lint-proof enclosure; unusual compactness and dependability. Size 0, 2 hp to 600 volts a-c.

BULLDOG ALUMINUM BUStribution® DUCT helps North American build Super-Sabres

1600-amp. LO-X BUStribution serves as main feeder to welding department to minimize voltage drop during welds.

North American F-100 Super-Sabre

600-amp. Plug-In BUStribution, with tap-off provisions each 10", provides 100% coverage of production area with 50-foot runs.

To keep their famous Super-Sabre Jets rolling smoothly off the line, North American Aircraft needed a dependable, flexible power distribution system. That's why, in two installations alone, they installed more than half-a-mile of BullDog Aluminum BUStribution Duct.

The high bay construction, and the obstacles presented by girders and pipes in the North American plant, were a natural for the use of lightweight aluminum bus duct. The weight saving in each 10′ duct section greatly eased the strain of the extra handling required in the installation job. Less dead weight on building superstructures, too.

These savings in installation costs — in addition to lower first cost — are prime reasons for the widespread use of BullDog Aluminum Conductors in plants throughout the country.

Aluminum BUStribution Duct features in its design the same quality and dependability that have gained BullDog world-wide reputation as a pioneer of bus bar distribution systems. It is completely interchangeable with other BullDog BUStribution systems and is listed by Underwriters' Laboratories, Inc. For complete information, consult your local BullDog Field Engineer. Or, write: BullDog Electric Products Company, Dept. ES-64, Detroit 32, Michigan. ©BEPCO

Export Division:
13 E. 40th Street
New York 16, New York

In Canada:
BullDog Electric Products Co. (Canada) Ltd.
80 Clayson Road, Toronto 13, Ontario

BULLDOG
ELECTRIC PRODUCTS COMPANY

CONSULT THE FOLLOWING SOUTHERN REPRESENTATIVES

Wilson Electrical Equipment & Company
2930 Commerce Street, P.O. Box 1725 — Houston, Texas
101 E. Maple Street — San Antonio, Texas

Walker Electrical Company, Inc.
70 Bonnett St., N.W., P.O. Box 8, Station D
Atlanta, Georgia

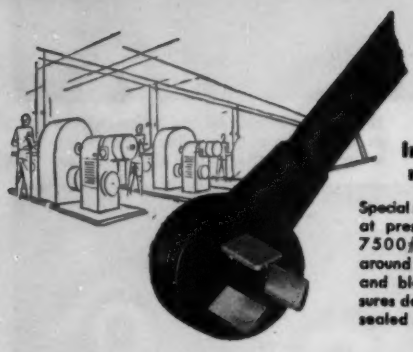
Standard Electric Manufacturing Co.
2401 Federal Street — Dallas 1, Texas
F. E. Bender Co., 2000 E. 7th Place — Tulsa, Oklahoma

THERE IS A "RIGHT" CORD

For Ranges and Dryers

It's a PARANITE® "SAFE" cord

and here's why

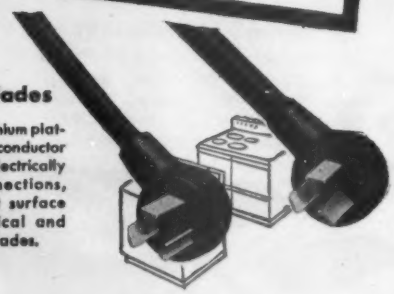


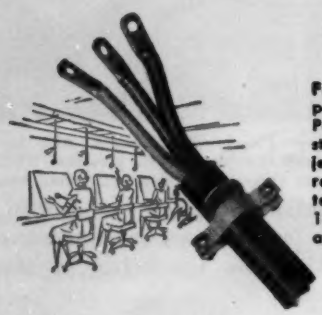
injection molded

Special rubber compound, at pressures exceeding 7500# p.s.i. forced around jacket, insulation and blade junctions insures dense permanently sealed rubber cap.

plated blades

Complete Cadmium plating, from tip to conductor crimp, assures electrically superior connections, better contact surface within receptical and clean bright blades.





100% "cords" control

From rubber, compounded specially at the Paranite Mill, through stranding, insulating, injection molding, strain-reliefs, terminals, and tests, these cords are 100% inspected and UL approved.

electrically superior

Insulation Resistance between conductors exceeds 32,500 meg-ohms. (50 meg-ohms standard). Dense molded cap insures exceedingly high dielectric strength properties.

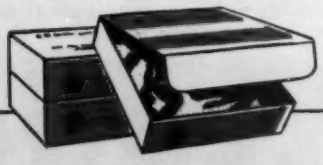
It takes specially compounded rubber, precisely controlled equipment and close supervision to injection mold these 90° angle caps . : : but look at the results! You get a firm, dense and more uniform permanently molded cap that means complete customer satisfaction:

Cadmium plating of blades is another important "extra" you get with all PARANITE Range, Dryer and Appliance Cords . . . which assures a more dependable and surer electrical contact:

PARANITE Cords give outstanding performance : . . Insulation Resistance of over 32,500 meg-ohms and extremely high dielectric qualities prove their superiority.

To perfect, manufacture and 100%-inspect cords of this calibre takes extra effort . : . but PARANITE "Safe" Cords have a reputation to maintain and *they must be* RIGHT!

RANGE CORDS	DRYER CORDS
RP-1 2 #8—1 #10	RP-10-PG 3 #10
RP-2 2 #6—1 #8	
RP-3 3 #6	



separately packed in sturdy cartons

If it's PARANITE it's right

PARANITE WIRE & CABLE DIVISION • ESSEX WIRE CORPORATION

FORT WAYNE 6, INDIANA

MANUFACTURING PLANTS: Birmingham, Alabama; Anaheim, California; Jonesboro, Indiana; Marion, Indiana.

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* Los Angeles, California, 2240 East Washington Blvd.
Minneapolis, Minnesota, 5407 Excelsior Boulevard
* Newark, New Jersey, 457 Frelinghuysen Avenue
Omaha, Nebraska, 320 W. O. W. Building
* Portland, Oregon, 525 North Tillamook St.
Upper Darby (Philadelphia) Pa., 6816 Market Street
Rochester, New York, 207 Powers Building
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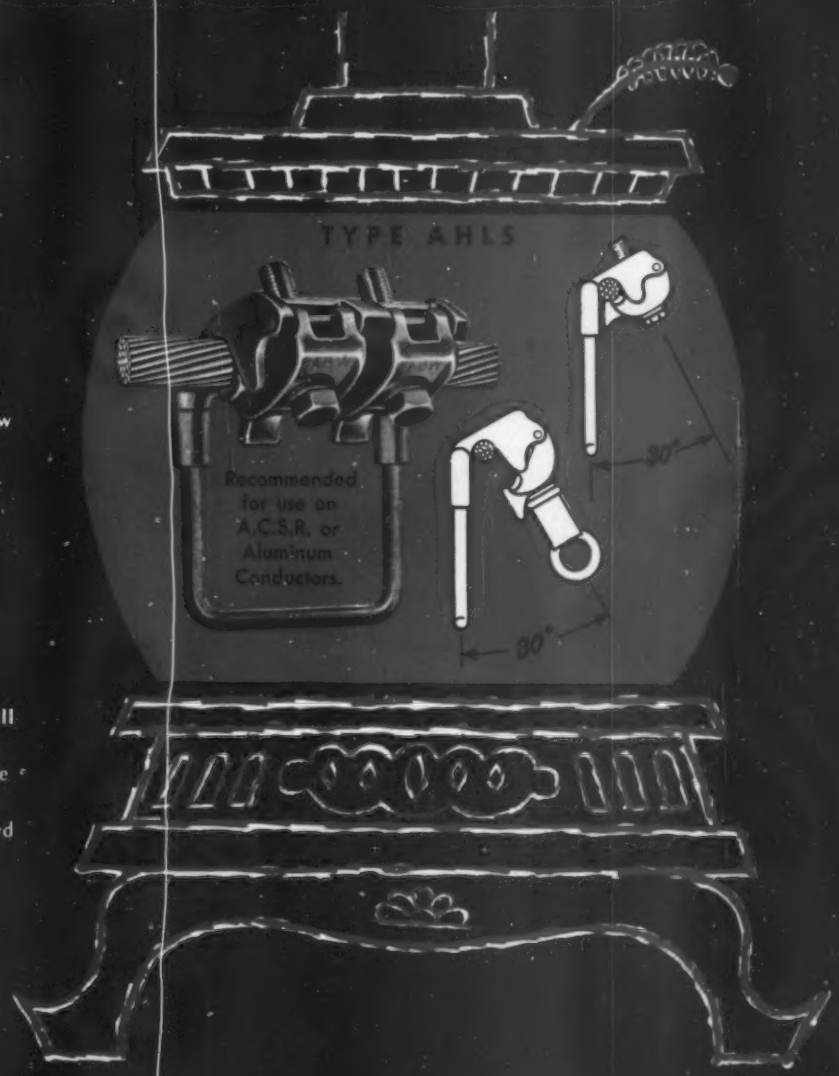
* Saint Louis, Missouri, 3435 Chouteau Ave.
* San Francisco, California, 1077 Howard Street
Springfield, Illinois, 104 South 6th Street

what do you EXPECT of a "hot" line STIRRUP CLAMP?

★ ABW DESIGN MEANS QUALITY plus STRENGTH in the RIGHT PLACES!

- NO CONDUCTOR ARCING DAMAGE?
- QUICK, EASY INSTALLATION ON A "HOT" LINE?
- POSITIVE, EFFICIENT TIGHTENING WITH "HOT-STICK"?
- LARGE CONTACT AREAS?
- LONG, TROUBLE-FREE SERVICE?



ANDERSON answers **all** your requirements with a brand new one-piece **"Hook-over" Hotline Stirrup Clamp . . . TYPE AHLS . . .** designed for time-saving installation, longer service life and rugged, efficient dependability in service.

The heat-treated clamp body, cap and eye are high-strength cast aluminum alloy. Copper stirrup loops are serrated and compression-bonded into the clamps . . . **can't pull out!** Bolts are furnished with both flat and split washers. Hinge pins are stainless steel, and all other hardware parts are alumilite-finished high-strength aluminum alloy.

FOR MORE COMPLETE INFORMATION consult your nearest ABW representative or contact our home office.

ABW

Aluminum & Bronze POWER CONNECTORS • CLAMPS • FITTINGS • ACCESSORIES
for SUBSTATION • TRANSMISSION • DISTRIBUTION SYSTEMS *for over a Quarter Century*

ANDERSON BRASS WORKS, INC.

P. O. DRAWER 2151 • BIRMINGHAM 1, ALABAMA

NEW G-E MOTOR

Saves up to

HERE'S a new product that spells savings all along the line . . . from initial purchase to on-the-job operation. G.E.'s all-new Motor Control Center (Type DA7093) puts your motor control capacity in approximately *half* the space formerly required. It takes nine NEMA size one or six NEMA size two control units in one standard 90-inch trough. This means fewer sections to buy, fewer sections to find space for and fewer sections to maintain — a clean-cut case of dollar-and-cents economy.

More than a space-saver, this new Control Center incorporates engineering advances which drastically cut installation time, step up capacity, simplify operation and slash maintenance costs.

Equally important, it embodies new safety features . . . *extra* features that provide *extra* safety to the contractor or plant engineer.

Look at these major engineering advances . . . which bring you unprecedented savings, dependability and safety:

Center Busing doubles vertical bus capacity (from 300 to 600 amperes) . . . leaves top and bottom pull boxes free for wiring within and between sections . . . allows continuous main bus of 600 or 1200 ampere capacity up through five sections.

Expands with your plant requirements . . . Select only those standardized sections, control units and accessories which meet your present needs. Then, as your power consumption grows, you can easily expand to keep pace with your changing control requirements. Only minimum or "on-the-job" wiring is necessary.

Compare the DA7093 with other leading competitive Control Centers. Feature for feature, dollar for dollar, you get more with G.E.'s space-saver.

MOTOR CONTROL CENTER FEATURES	[illegible]	Mfg. A	Mfg. B	Mfg. C
Can accommodate 9 size 1 starter units with disconnect and transformer	[illegible]	No	No	No
Center Busing	[illegible]	No	No	No
Split Type "B" Terminal Blocks	[illegible]	No	No	No
Individual Stab Blocks	[illegible]	No	No	No
Individual bus insulators	[illegible]	No	No	No
Positive unit grounding	[illegible]	No	[illegible]	No
Straight-in wiring to main lugs accessible from front	[illegible]	No	No	No
No across hinge wiring	[illegible]	[illegible]	No	No
Edge to Edge Configuration Main bus	[illegible]	No	[illegible]	No
Minimum 4¾ x 6 inch wiring gutter	[illegible]	No	No	No
Unit Pull handle	[illegible]	[illegible]	No	No
Vertical Bus, minimum 5 inch spacing	[illegible]	No	No	No

CONTROL CENTER

50% in Floor Space

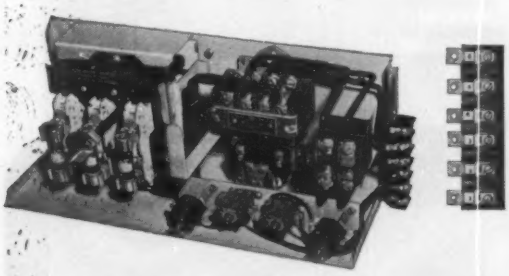
Split Type "B" Terminal Blocks allow you to add, switch or extract control units *without disturbing established wiring.*

Individual stab mountings cut your maintenance costs by as much as one-third because they can be replaced individually.

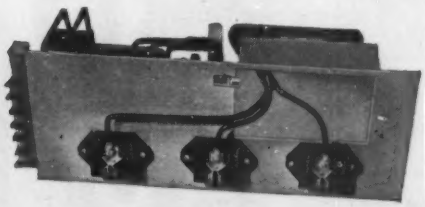
Positive grounding of each control unit *before* units engage bus bars. This, plus locking devices for both the control unit and operating handle, gives *added* protection.

Add a whole host of other design developments and you'll agree the DA7093 is designed for the future — *your* future.

For further details, please contact your nearest General Electric Apparatus Sales or Assemblies & Components Sales representative. Or write for Bulletin GEA-6160 — General Electric Co., Distribution Assemblies Department, Plainville, Connecticut.



Control unit showing neat arrangement for easy maintenance. Type "B" Terminal Blocks (shown right) permit unit to be removed without disturbing wiring. Notice the fusible disconnect that can accommodate either or both Type NEC or Type CLF current limiting fuses.



Rear view of Control unit showing three individual bus stabs of silver-plated pure copper. Re-inforced with heat-treated spring steel, they assure positive contact with vertical bus.

Let a G-E motor control specialist show you how to conserve your motor control floor space. Let him help you select equipment for your specific requirements.

1. Center busing ups bus capacity from 300 to 600 amps . . . leaves top and bottom pull boxes free for wiring within and between sections. Result: more ampere capacity per dollar; quicker, easier installation.
2. Large wiring gutters (4¾" x 6"), plus wiring straps to keep wiring clear of units, simplify installation.
3. Removable cover plates for continuous center busing . . . hasten installation.
4. Doors that open past center so they won't hamper installation or maintenance work.
5. Disconnect handle takes three padlocks for *added* safety.
6. Pilot devices are mounted on control unit, thus eliminating across-the-hinge wiring . . . preclude frayed wiring with resulting short circuits.

Progress Is Our Most Important Product

GENERAL ELECTRIC

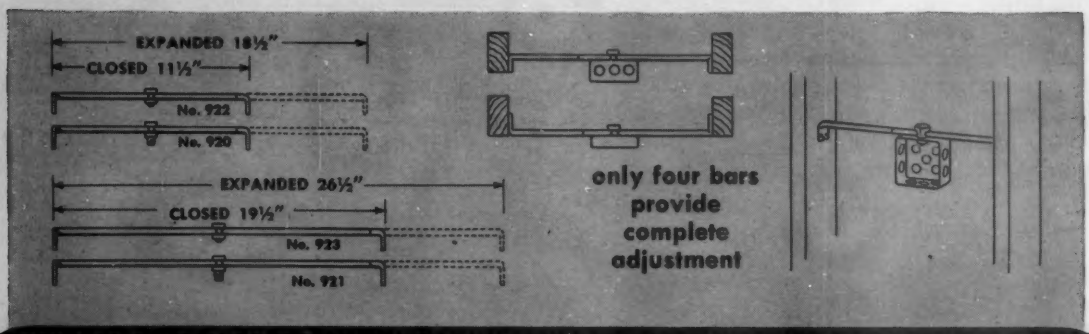
NOW! RACO OFFERS

the first adjustable bars that fill every requirement... pass every test!

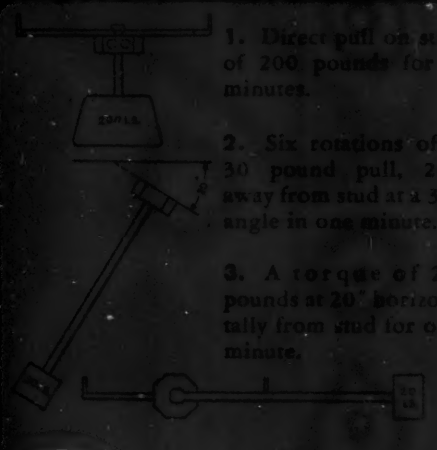
RACO

ONLY 4 BARS ENABLE YOU TO INSTALL ANY DEPTH BOX WHEREVER YOU WANT IT REGARDLESS OF STUDDING SIZE OR SPACING

STOCK JUST 4 BARS INSTEAD OF 16



NORMAL SAFETY PRECAUTIONS REQUIRE THAT A BAR MUST WITHSTAND THESE TESTS



1. Direct pull on stud of 200 pounds for 5 minutes.

2. Six rotations of a 30 pound pull, 20" away from stud at a 30° angle in one minute.

3. A torque of 20 pounds at 20" horizontally from stud for one minute.

Raco's Adjustable Bar Passes These Tests!

There is strength to spare due to these special formations!

Use Raco's New Clip or Popular Stud!

The new Raco Clip uses a strong new saddle of 13 gauge steel, formed steel clip and sheet, screws No. 4-30 round head screw. Popular Raco Stud uses the same saddle, a formed 13 gauge steel stud with set bolt, sheet No. 10 threads and a steel No. 8-32 screw.

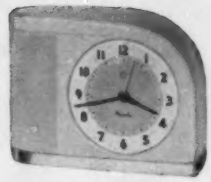
Raco Clip provides maximum range of stud sizes and a round mating object in any pipe size.

WRITE TODAY • get complete information on Raco Box Hangers

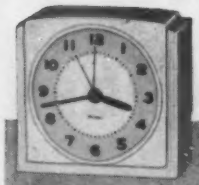
YOU CAN ALWAYS DEPEND ON RACO

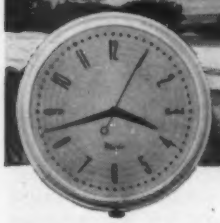
ASE RACO

ALL-STEEL EQUIPMENT INC. Aurora • Illinois



WE'RE HAPPY TO BE HERE!



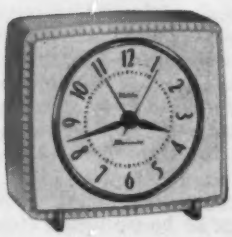


Westclox Electric Clocks are now being made in Athens, Georgia

This new General Time Corporation plant is the most modern, up-to-the-minute electric clock factory in the world.

We took a big step in establishing a plant in Athens, Georgia. It meant a huge investment in land, buildings, machinery and equipment. You have given us a warm welcome, and we most gratefully thank you.

We are proud of our new plant . . . just as we are proud of our products and the name they bear—Westclox. And we repeat, we are happy to be here. We have come down South to work and to live and, with you, to prosper.



WESTCLOX

Electric Clocks

made by the makers of BIG BEN

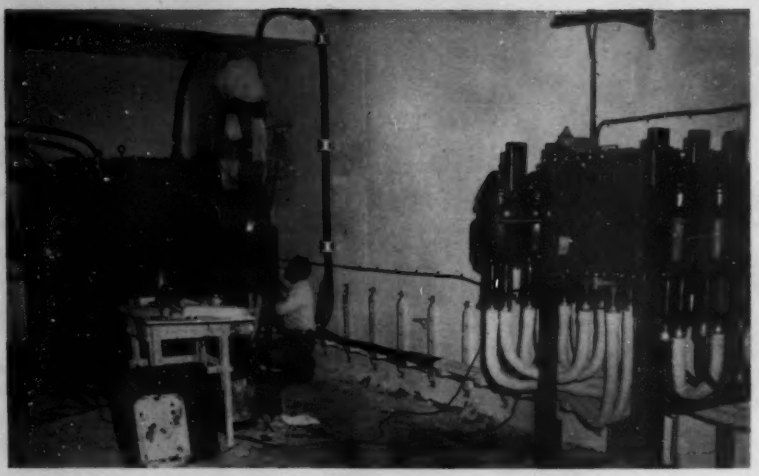
La Salle-Peru, Illinois

Products of GT GENERAL TIME *Corporation*

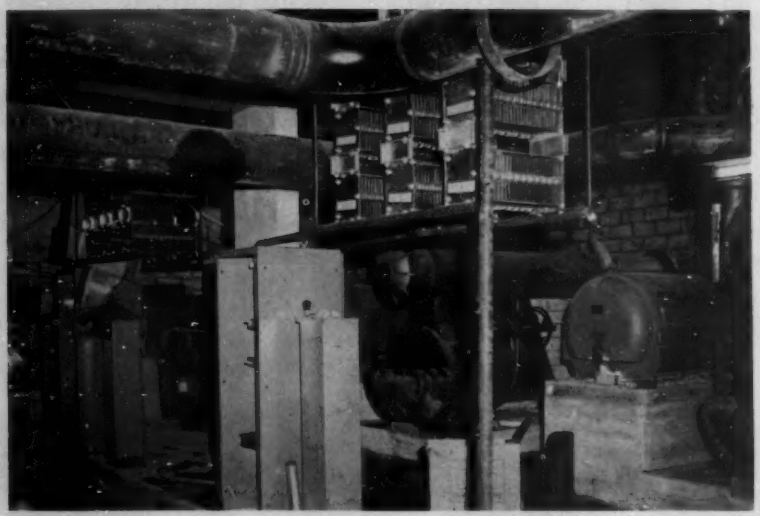
Complicated problems for contractors . . .

Distinct advantages for owner . . .

Wiring of a windowless



For the new Burdine windowless store in West Palm Beach, the Florida Power and Light Company installed a sub-basement substation with two 500-kva transformers which feed power to the building via two busways, one of 3,000 amp and the other 4,000 amp.



A switchboard, two 300-hp compressors, three 40-hp chilled water pumps, and three 25-hp condenser water pumps for cooling as part of the water-to-air conditioning system are housed in the penthouse machine room.

◆ DESPITE the fact that electrical work in a modern, windowless type building is much more expensive than in a building with windows, there are certain advantages for the owner of the building. This is the belief of spokesmen for the J. R. Hime Electric Co., Palm Beach, Fla., which has recently completed a $350,000 electrical contract in the new Burdine department store in West Palm Beach.

The Hime company lists the owner's advantages as:

(1) a uniform light level throughout the building

(2) requirement of lower horsepower air conditioners because there is more uniform temperature as the result of lack of sun beating down on windows, and

(3) savings because there is no need for expensive storm shutters.

Not having to have storm shutters eliminates the trouble and expense of storing during good weather and expensive installation each time there is a storm warning, in addition to the initial high cost of the shutters.

More outlets necessary

The new Burdine store consists of a sales area of three floors, each 150 by 300 feet, a mezzanine sales area of about half that size, a penthouse machine room and a basement vault for a substation, in all about 155,000 square feet. For this area, 3,000 outlets were required, or about double the number that would have been needed had the building been the conventional type. The only windows in the store are the show windows on the main floor and a large picture window in the third floor restaurant area.

Incidentally, the many show windows are to be protected from

by C. E. Wright

building

hurricane winds by an ingenious arrangement of pull-down shutters, which form the ceiling of the sidewalk overhang on two sides of the store. These can be easily and quickly let down when there is a storm warning.

Relocating utilities

Before work could be started on the building there was a problem of re-location of utilities, which included electric power lines for both general consumers and street lighting, telephone wires, Western Union wires, sanitary sewers and storm sewers. In a deep basement, which can be entered only from outside the building by a vertical steel ladder, the Florida Power & Light Company installed a substation with two 500 kva transformers, which fed power to the building via two busways, one of 3,000 amp and the other 4,000 amp. This installation and others throughout the building were designed for approximately double the power load that will immediately be required, as plans call for an ultimate three-story addition to make a total of six floors.

The switchboard was placed on the penthouse floor so that it will be centrally located when the additional floors are added. Three busways rise vertically to the switchboard in the penthouse machine room through circuit breakers, one of 4,000 amp and two of 3,000 amp on each floor. The busways are made of laminated copper bars one-fourth by four inches, with four bars to the phase. Thus the total weight of the busways was 12,000 pounds, which made it necessary to design a support to keep this weight intact. This was done by placing an ebony wood clamp about every 15 inches.

Three busways of 3,000 amp rise vertically to the switchboard through breakers: one of 4,000 amp and two of 3,000 amp on each floor. Busways are laminated copper bars one-fourth by four inches, four to the phase.

In the penthouse machine room there are, besides the switchboard, two 300-hp compressors, three 40-hp chilled water pumps and three 25-hp condenser water pumps for cooling, all part of the water-to-air conditioning system, which was installed by Alexander Orr, Inc., of Miami. There are 33 cooling fans, ranging from three to 15 hp, in the building.

Before any permanent wiring could be done in the Burdine building, a temporary lighting system, which cost several thousand dollars, had to be set up. The electrical contracting company did not start its work until the walls and roof were completed, so without windows there was almost complete darkness for interior work of any kind. On the ground floor permanent wiring was encased in floor ducts below the terrazo flooring, which was to be

(*Continued on page 94*)

Portable

Four by four angle iron placed as shown holds floor level and in place. Angle irons lie across cross-ties. Note the bolt head above the two-by-four at right rear. Bolts inserted into matching holes in two-by-four and two-by-six joist hold walls to floor.

◆ A HIGHLY SATISFACTORY type of material house that can be moved from job to job with relative ease, and has an average life of ten years, has been used advantageously by James H. Hall, of the Hall-Allen Electric Co., in Dallas, Texas, for many years.

At today's prices this shack, shanty or whatever the contractor may prefer to call it, costs $400 to build, but over a period of ten years the investment spreads out at the rate of $3.331/3 cents a month.

Easy to assemble

In four hours two men at $1.25 per hour each, or a total of $10 labor cost, can dismantle the house, load it into two pick-up trucks,

For a large job, the Hall-Allen company will use a number of the material houses. Five of the huts, which have an average life of ten years, are shown here assembled for a job in Dallas.

take-down material house

—economical and durable

transport it to another job and reassemble the unit, ready for use.

Mr. Hall likes to compare these costs and figures with the cost of building a new material house, all of lumber, for each job.

"To build a material house on the job costs from $150 to $200," he points out. "When you are through with such a house you may salvage $50 worth of material. Of course, a house mover could shift this house to another job, but that would cost $25 at least, probably more.

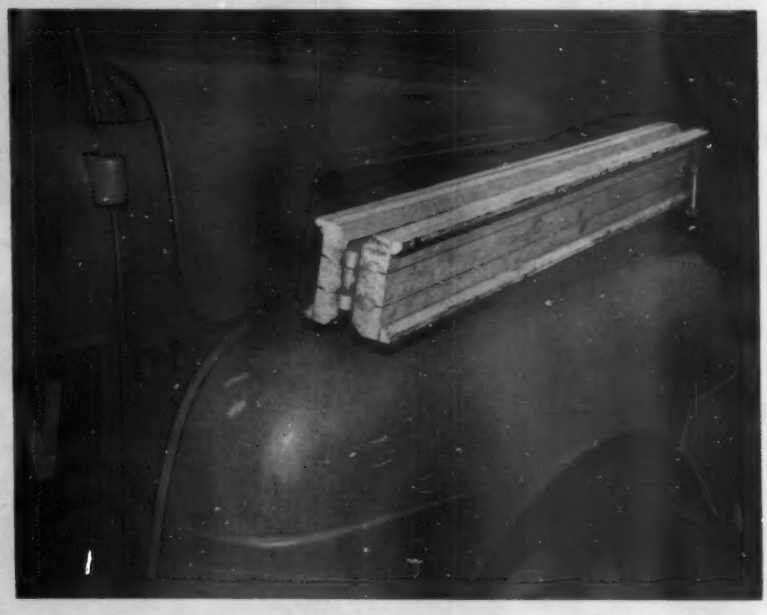
"We built our first portable, take-down house in 1937 and used it for 16 years, at a cost of $6.25 a year, for it cost only about $100 to build then. I have no idea how

Second to be removed in take-down is front half of roof, loaded on truck.

Isaac Okes, left, long-time company employee, and his helper, can take down a house, move it to another job and reassemble it, all in four hours time. Removal of front wall is first step of the take-down.

To eliminate the recurrent cost of material houses for each new job, James H. Hall designed his first take-down house in 1937.

The building is held together with loose-pin hinges and the sections are color marked for easy identification. This one window is for ventilation.



The hinged piece shown is to make house weatherproof where roof sections do not join tightly. Hook at end holds "ridge-runner" in place.

many jobs that house was used on, but it was certainly worth the money.

Wood for office use

"Recently, we built a portable-take-down house of four-foot plywood sections, 16 feet long, for use on jobs where it is necessary to have an office. Our regular on-the-job houses, largely of sheet metal construction, get pretty cold in the winter. This plywood house is a lot heavier, of course, and not so easy to move."

The Hall-Allen portable material house is 8 feet wide, 14 feet long and 7½ feet from floor to ceiling. It is provided with two doors and one window, plus a take-down conduit rack, which made it necessary to have the second door.

Compact sections used

From foundation to roof it consists of single members or solid sections. These sections consist of a 2 by 2 frame faced with 26 or 28 gauge sheet metal. The sheet metal is a type that features regularly-spaced, raised "V's" for added strength. The 2 by 2 frame is mortised at corners and cross braces are notched in. Sheet metal is attached to the frame with roofing nails.

All in all there are ten pieces, or sections, of the house which fit neatly together and are held in place with the inside, loose-pin hinges at all corners and joints, including the attachments of roof to walls.

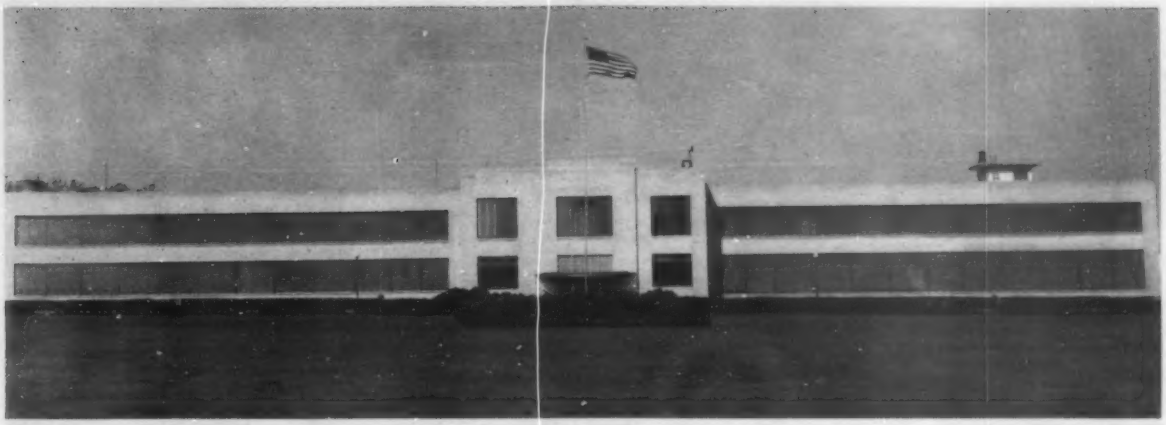
Floor and walls are joined securely by inserting half-inch bolts, four inches long, into matching holes. These are drilled through the broad sides of 2 by 4's, which form the base of each wall section, through the flooring and into the 2 by 6 floor joists.

Regular flooring

The foundation starts with two cross ties, across which are placed two 14-foot lengths of 4-inch angle iron. These lengths of angle iron cradle and solidify the floor, which is of regular tongue-and-grove pine flooring, in two sections, each 7 by 8 feet.

The two end walls, one containing two doors, are both in one piece —8 by 7½. Each side of the house consists of two sections, each 7 by 7½ and the roof, featuring a slight

(*Continued on page* 94)



Nature of the work at the Engineering and Research Corporation in Riverdale, Md., necessitates a systematic and careful maintenance plan.

Good records minimize maintenance

by Henry F. Steele

Shop Foreman and Chief Electrician
Engineering and Research Corp.
Riverdale, Md.

◆ LIKE OTHER INDUSTRIAL plants we have always watched our maintenance costs with a view to deriving maximum efficiency from machinery with minimum costs.

Toward this end we installed about a year ago a card system on which we record not only machinery and electrical installation costs but also all repairs in terms of time and material costs. From repair tickets made out by our maintenance men, postings are made to the lathe, boring mill, grinding machine and other type of machine card by a full-time clerk in charge of this file. General inspections of machinery and findings are posted monthly. The time it takes to repair a machine is computed against a man's rate of hourly pay and material costs. In this way we know what machines cost in maintenance against production time.

Comparison of machines

If machinery has to be overhauled, we can now estimate costs more closely on each machine. We also are now able to form a better judgment on machines of competitive make by the life and maintenance needs of a machine from the history the card presents us with. Maintenance costs are computed every three months.

While all mechanical maintenance has thus far been posted to the machine card, we are now including electrical maintenance so that accurate figures on over-all savings will not be available for several months.

As an aircraft plant working for government and industry, we have installations for testing Navy mobile trainers and Air Force console trainers.

Nature of work

The work of our department is to keep voltages at certain minimums in the testing of these assimilators. This involves checking all switches, conduits, and power lines on the 1,800-ampere service into which they are hooked right through the hooking into the trainers. We have made wiring more flexible by running lines down the main conduits and then running flexible lines for testing machines both inside and outside the building.

The problem of keeping outside switches watertight led us to build rainsheds at 11 locations.

We use busway plug-in switches which we have found cut down maintenance costs of running power lines. Since most of our installations are exposed, the use of a busway system lowers initial installation costs, materials and maintenance costs.

Plug-in benches

As another savings measure, we have been using workbenches on a plug-in system. With rubber drops plugged right into the workbench from overhead, we simply take our workbenches wherever we need them by plugging out of the main feedboxes and into an installation when a change of plans necessitates this. This has proven a great time-saver wherever we have an assembly line.

We have also put up light racks to hold two fluorescent lights on an eight-foot bench. Using a four-foot fixture, we can plug right into the bench making it a complete unit.

The fluorescent lights are on straps 20 feet off the floor. Light is thus brought to within six feet of the floor furnishing our maintenance men with plenty of light. This too has demonstrated itself a

(*Continued on page 94*)

Louisville, scene of Western Section, IAEI, 50th Annual Meeting.

Western Section, IAEI, is planning its

Golden Anniversary meeting

◆ ARRANGEMENTS are being completed now for the Golden Anniversary meeting of the Western Section, International Association of Electrical Inspectors, which will be held in Louisville, Ky., October 11-13, 1954, at the Seelbach Hotel.

The meeting will center around discussions of the National Electrical Code and its applications.

Committee chairmen

W. D. Roach is general chairman of the annual conference, and is being assisted by the following group of chairmen: R. H. Scherzer, Hotel Hospitality; George Muench, Program; Charles Brown, Finance; Ray Tillman, Publicity; E. J. Theobald, Jr., Exhibits; Jack Coady, Entertainment; E. M. Nelson, Booster; A. L. Langley, Gifts; N. E. Childers, Badge and Printing; R. J. Heffernan, Activities; Mrs. Freda Knadler, Hostesses; Mrs. Mary Langley, co-chairman, Hostesses; E. "Butch" Nelson, chairman, Little Brown Jug Club; and R. W. (Bob) Wilson, co-chairman.

Louisville industry

Louisville and the surrounding area offer many features which will be of interest to those delegates who attend the meeting of the Western Section. Although its industry is widely diversified, in recent years the city has become one of the printing centers of the United States. It is also known as the location of the largest neoprene rubber plant in the world, and in addition has such industrial activities as a large baseball bat manufacturing plant, and about 20 organizations for the manufacture of paints and varnishes.

Transportation

Louisville is readily accessible by eight trunk line railroads radiating in all directions, and is a southeastern bus and truck hub. The city is served by four airlines.

Southern Section IAEI plans 26th meeting

by A. M. Miller
Secretary-Treasurer

◆ MEMBERS of the Southern Section, International Association of Electrical Inspectors, have recently been notified that the section's 26th Annual Meeting will convene in the Tampa Terrace Hotel, Tampa, Fla., on October 25-27, 1954.

The tentative program includes speakers on subjects of interest in inspection, reports of Code Section Committees, and Code Application problems with Ben Z. Segall, consulting engineer, New Orleans, and Frank Camus, electrical contractor, Shreveport, La., as moderators. An evening session will feature demonstrations of equipment for use in hazardous locations.

Chapter secretaries are requested to prepare for a special meeting on Tuesday morning, and it is hoped that all Chapters will arrange for attendance by their secretaries.

We are assured by Russell Miller and the Tampa Committee that the Jolly Gasparilla has been hauled down for this occasion. The haunts of his piratical hordes are now in safe hands, immunity for the balance of this year having been purchased by the good people of Tampa.

Entertainment for the ladies will be provided by the Ladies Entertainment Committee, and will include sightseeing trips to Cypress Gardens and water skiing contests.

Another feature of the meeting will be further discussion of National Electrical Week, for which R. E. Ward is Southern Section chairman. With announcements of the Southern Section annual meeting, Mr. Ward has mailed each member a car bumper strip advertising the Week. Members will receive later a brochure of other advertising material that is available. It is suggested that all orders for such materials for National Electrical Week be placed through local chapter chairmen.

Those who will take an active part in plans for the Week, will be interested also in a 16-page Organization Guide which is being made available by IAEI. The booklet will be especially helpful to state or chapter planning committees.

Members are urged to plan to attend the Southern Section meeting and to arrange hotel reservations as soon as possible.

Know the law

by Arthur L. H. Street

Liability of owner to contractor

◆ A CASE lately decided by the Florida Supreme Court suggests some interesting legal questions, as to the liability of an owner or occupant of a building for injuries to an electrical contractor or his employees resulting from a defective condition of premises where electrical or other work is being done. (Bottom v. Rank, 70 So. 2d 832.)

The contractor was asked by defendants to examine air conditioning units in their home and to remedy unsatisfactory operation of the equipment. The units were seven feet above the floor. A board extending between supports to which it was not nailed enabled him to measure the units. Before standing upon it, he tested it and satisfied himself that it was strong and secure enough to carry his weight. But the board gave way and he fell to the floor and was injured.

Suit dismissed

The contractor's suit for damages was dismissed on the ground that the defendants were not liable, and the Supreme Court okayed the dismissal.

The lawyers and the courts seem to have agreed that when defendant invited the contractor to his home to examine the air conditioning units, he was bound not to expose the contractor to any risk of accident due to defective condition of the premises — known to defendant or which he should have known — to the extent that the condition was not plainly observable by the contractor. The Supreme Court said what would be applicable to use of ladders and other facilities belonging to the property owner:

Plaintiff's choice

"The plaintiff" — the contractor — "entered the room by himself and selected and pursued his own methods for accomplishing the task of planning and measuring for the installation of the equipment. * * * Merely because the plaintiff 'chose' to use the facilities of the defendants instead of his own, the plaintiff cannot in the absence of an agreement cast the burden of the consequences upon the defendants."

Probably, the most common cause of accidents we are now discussing would be a defective ladder owned by the building owner used by the contractor or an employee. Most courts would be apt to say that the owner would not be liable for injury caused by breaking of a rung or other part of the ladder unless it should be proved that the defect was so concealed that the contractor would not discover it on inspecting the ladder, but was known by the owner to exist.

Furnish own material

The lesson to be learned from the Florida case would seem to be that where a contractor or his employee goes to a patron's building to inspect, construct or repair equipment, he should, if feasible, take with him a ladder and such other similar equipment as he is apt to need, rather than rely on facilities furnished by the patron.

Lesson in making binding contracts

◆ BECAUSE a subcontract to install electrical equipment in a Mississippi hotel was partly in writing and partly oral and was affected by a confirmation not in line with the agreement, a lawsuit resulted. We review the decision rendered by the United States Court of Appeals, Fifth Circuit, in this case (Air Conditioning Engineers, Inc., defendant - appellant, v. O'Neal Electric Co., plaintiff-appellee, 212 Fed. 2d 915).

One cannot read this decision without realizing the importance of written acceptances of written offers and careful wording of both documents so as to show unqualified agreement.

Subcontractor's position

Incidentally, the decision shows that where a prime contractor sublets electrical work, the subcon-

(*Continued on page* 92)

Aluminum conductor terminating

by R. R. Cope

Head, Electrical Section
Development Division
Aluminum Company of America

◆ UNDER present economic conditions, and considering the future supply of basic materials, aluminum is gaining considerable headway as a material for electrical conductors, both in the transmission field and in the field of insulated electrical power conductors. The supply prospect for aluminum and its economic position with respect to copper indicate for the future a steady increase in applications of aluminum electrical conductors.

Electrical conductor grade (EC) aluminum is a ductile metal having a conductivity of 61% of the International Annealed Copper Standard (I.A.C.S.). Tensile properties of EC aluminum are dependent upon the amount of cold work to which the metal is subjected. EC aluminum can vary in tensile strength from 30,000 psi for hard drawn material to 12,000 psi for annealed material.

Oxide affects connections

Aluminum, like copper, will oxidize when exposed to air. The oxide film on aluminum is highly protective, which accounts for the excellent resistance of the metal to corrosive environments. The extremely thin coating of aluminum oxide that forms when aluminum is exposed to air clings very tenaciously to the metal instead of flaking off. It is this tenacious oxide coating on aluminum, clear in color, which makes aluminum more difficult to connect and terminate. To effect a satisfactory joint on aluminum, this oxide must be removed or broken up in such a way that the conductor metal can actually come in intimate contact with the connector applied to it.

In most electrical circuits involving aluminum conductors, the aluminum will be called upon to perform with existing circuits of copper. Electrolytically, copper and aluminum are far apart in the galvanic series, so that in the presence of electrolytes, galvanic corrosion can occur. It is therefore necessary to design fittings and terminations for aluminum that will be compatible with copper, and vice versa. The problem of galvanic corrosion, however, is not serious because most electrical circuits are protected for insulating reasons by tapes, compounds, or by enclosures or cubicals. Galvanic corrosion can occur only when an electrolyte is present; if circuits are reasonably dry, no difficulties will be encountered from this cause.

Design for aluminum

The use of aluminum for power and feeder cable differs considerably from aluminum used for transmission and distribution. Power and feeder cable are generally confined by space limitations; therefore, fittings and accessories must be scaled down to fit the dimensional tolerances allocated to the conductors. Transmission cable, on the other hand, is not confined by space limitations and connectors may be as large as is necessary to effect low initial joint resistances.

As mentioned previously, EC aluminum (electrical conductor grade) has a minimum conductivity of 61% of the International Annealed Copper Standard. This means for equivalent current carrying capacity the cross sectional area of the aluminum conductor must be increased by approximately 64% over that of a copper conductor. The density of aluminum is approximately 30% that of copper, which means that the volume conductivity of aluminum is approximately 200% that of copper; therefore, a pound of aluminum will provide twice as many feet of conductor as a pound of copper, and both conductors will have the same current carrying capacity. For example, one pound of aluminum will make a No. 6 conductor approximately 40 feet long, while a pound of copper will make a No. 8 conductor approximately 20 feet long.

Light weight advantages

The light weight of aluminum conductor per foot is a factor that influences its use in the design of electrical equipment. Because of its light weight, aluminum conductors can be installed with supports that are less complicated, spaced farther apart, and fabricated from less costly materials. The increased cross sectional area of the aluminum conductor may be a factor in the opposite direction, however, for aluminum conductor will require more insulation than does the copper conductor. The over-all design of any electrical system is a compromise where one material or the other is selected for particular circuits based upon these various perimeters.

For these reasons, an aluminum system should be designed from the ground up. Too often, an electrical system designed for copper and aluminum sizes are then substituted from tables without regard for the savings in installation costs that can be realized because of the light weight of the aluminum conductor.

Uses well established

Over the past 7 to 8 years, a background of experience has built up through many successful installations of aluminum conductors. All of Alcoa's plants built since 1947 are completely wired with aluminum electrical power and feeder cable. Techniques of joining and terminating have been established that will be described in the following paragraphs. The successful use of aluminum electrical conductors is therefore an engineering job and not a substitution job. New tables of current carrying capacities are being prepared which will avoid the past dependence on tables prepared for copper.

Aluminum conductors can be terminated and joined in the same

techniques

manner as copper conductors—by the use of compression terminals, mechanical terminals, soldering, or welding. All of these various methods have been utilized in Alcoa's Plants and have served well over a rather long period of time.

A compression terminal, for use on aluminum, is made either from aluminum tubing or as a casting having a hollow barrel. This type of terminal is then compressed onto the table by means of suitable tools. These are plier operated tools for very small conductors; bolt cutter type tools for larger conductors; and hydraulically actuated tools for very large conductors.

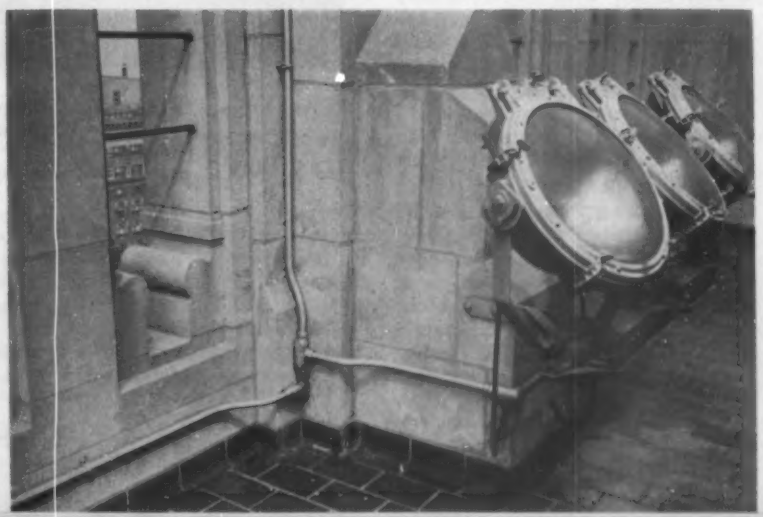
The compression or distortion of the terminal barrel may take several forms. One type of compression, known as the indent, consists of pushing a ball into one side of the terminal barrel; the circumferential crimp is made with a pair of dies which exerts pressure around the periphery of the barrel, resulting in either a circular or hexagonal cross section after compression. As a preliminary to the installation of this type of terminal on aluminum conductors, the use of petrolatum type joint compound to seal out moisture is strongly recommended. These joint compounds are available through the terminal manufacturers and are often sealed into the terminal barrel by the fittings manufacturer.

Mechanical terminals are usually in the form of castings, either aluminum or copper. Copper terminals generally are coated with tin, cadmium, or zinc, for use with either aluminum or copper conductors. Mechanical terminals are generally made in two pieces bolted together by two or more bolts placed on each side of the conductor. A mechanical terminal, to be successful on aluminum for heavy duty service, should have a relatively long barrel length (2½ or 3 times the cable diameter) and be capable of exerting considerable

Eight-inch aluminum channel bus supplying electric power in the Apex Building, Washington, D. C.

(Above) Method of dead-ending 1,000 MCM aluminum cable feeders with welded aluminum lugs.

(Below) Eight hundred feet of aluminum conduit installed in 1925 for floodlighting system of Southwestern Bell Telephone Building, St. Louis, still serves.



pressure on the conductor. The pressure should be distributed over a large area so as not to deform the cable. In this type of connection, it is desirable to use a joint compound to ensure low joint resistance. If a copper alloy connector is used, the joint compound also minimizes any possibility of galvanic corrosion.

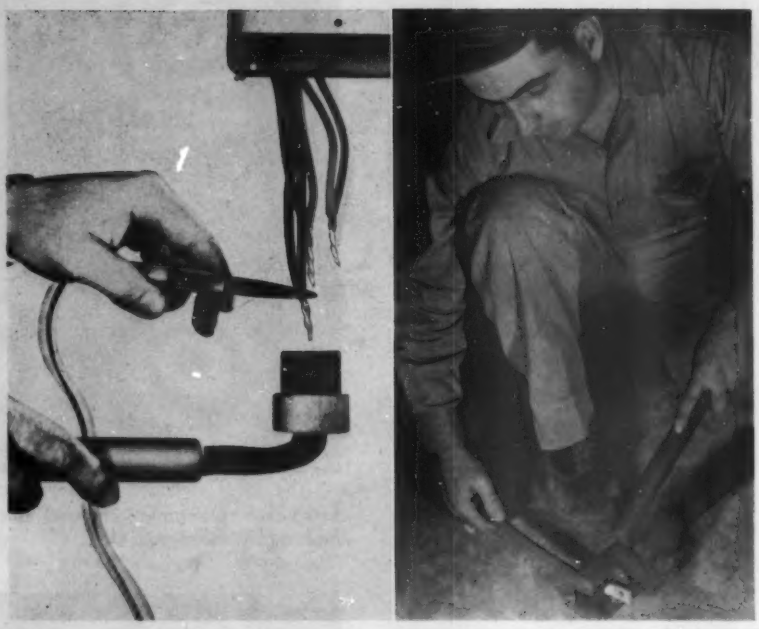
Soldering is a method of terminating a conductor which is still used to a large extent on copper and which can be successfully employed with aluminum conductors. During the war, Alcoa developed a non-corrosive, organic flux that permits the soldering of aluminum by the same techniques normally used on copper—that is by the use of an iron, torch, dip ladle, or by sweating the parts together. Soft solders for use with aluminum are either lead-tin-zinc solders or zinc-cadmium solders. For soft soldering aluminum conductors, the lead-tin-zinc type solders are generally used since they work better with the non-corrosive flux that has been developed.

Where a large number of terminations are to be made (for example, in large industrial plants or multi-story buildings), **welding** offers one of the best means for joining an aluminum terminal to an aluminum conductor. These terminals are generally cast from conductor grade metal. The welding is done by the inert gas shielded arc method or by the use of a consumable aluminum electrode protected by an inert gas such as argon or helium. In this type of welding, no fluxes are employed and all the strands are welded to each other and to the side wall of the terminal. Alcoa uses this type of joining method for all aluminum cables larger than 300,000 circular mils.

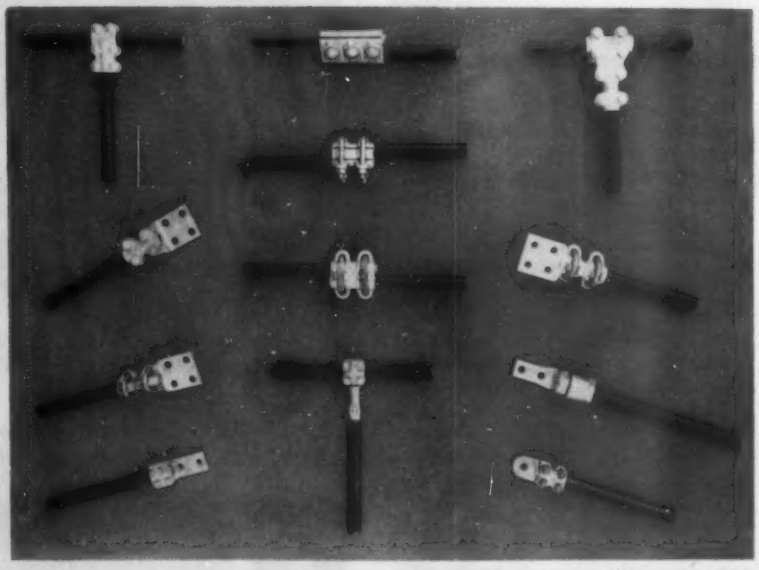
Cold welding of aluminum is of considerable interest to many electrical engineers, since it provides a convenient and satisfactory means of joining some electrical conductors. There is no cast metal in a cold welded joint since no melting has taken place. This type of welding is done by the application of high unit pressure sufficient to cause a cold flow of the two aluminum pieces being joined.

Tools have been developed which permit lap welding of sheet, and lap or butt welding of wire. In making lap welds of sheet or wire, pre-treatment by scratch-brushing of the surfaces is required and the deformation necessary to effect sufficient cold flow of the metal is about 70% of the original metal thickness. This deformation is undesirable in many applications because of stress concentrations at the point of deformation and because of the attendant weakness in fatigue and bending. This difficulty has, of course, been overcome in the butt welding of joints since there is no decrease in the cross sectional area and the flash can be removed after the weld has been made.

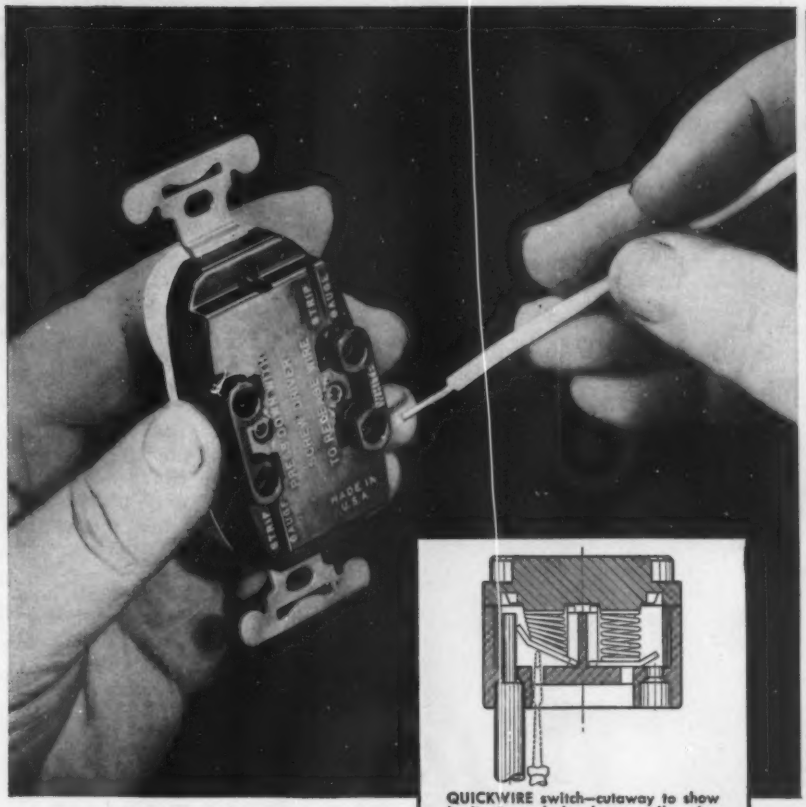
(*Continued on page 92*)



(Left) To make welded pigtail joint in insulated aluminum conductor, cover is stripped back and conductors are twisted about six turns. Joint is grasped near the top with electrode pliers, and the weld is made by striking an arc between the wires and the carbon electrode. (Right) Electrician makes pressure connection for aluminum wires up to 4/0 size.



Bolted fittings for aluminum insulated wire and cable. Compression fittings are also available as well as terminals designed for welding.



QUICKWIRE switch—cutaway to show Leviton's *exclusive* heavy coil spring pressure connector.

EASILY THE BEST!

— Quick and easy installations are done best with

NEW LEVITON Quickwire

spring type, screwless terminal switches and receptacles.

QUICK — because there are no wire loops to make, no screws to loosen and tighten. EASY — because you simply strip the wire and push it into hole. BEST — because Leviton's **exclusive** heavy coil spring connector holds the wire in place firmly, making permanent contact. To release, simply insert a screwdriver into the release hole.

You save time, money, labor costs when you use QUICKWIRE spring lock switches and receptacles. Simple, easy-to-read instructions are molded into the Bakelite on each device. Deeply recessed wire wells prevent exposure of bare wire. Fully enclosed housing, plaster ears, and handy strip gauge marking on each device.

QUICKWIRE receptacles are available in brown or ivory phenolic. Switches have either brown or ivory toggles and the same famous Leviton switch mechanism — known for service and dependability the world over. And both devices meet UL, CSA and Federal Specifications, of course.

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Connections that *cannot shake loose* when subjected to jarring motion or vibration are possible with LEV-O-LOCK devices. A simple turn of the cap locks cap and connector or receptacle quickly — and tightly. Sturdy construction features assure long life and latest design makes wiring fast and simple. Interchangeable with other standard interlocking devices, LEV-O-LOCK devices are listed by the Underwriters' Laboratories, of course. Available in 2, 3 and 4 wire 10 and 20 Amp. Caps, Connectors and Receptacles.

For complete information write Leviton Manufacturing Company, Brooklyn 22, N. Y.

The six-story and basement office building of Mutual Insurance Co., in Decatur, Ala., is one of the largest buildings of its kind in the South served by air-to-air heat pumps for heating and cooling. It is believed to have, through exclusive use of electricity, the lowest utility operating cost of any similar building in the country.

The large central duct similating a beam through halls and work areas of the Mutual Insurance Company building is covered with insulated acoustical asbestos same as the rest of the ceiling.

Electrical

◆ AIR CONDITIONING for what is probably one of the largest office buildings in the country to have electricity as its only utility, has been supplied with heat pumps for temperature control summer and winter.

This year-round air conditioning installation was recently completed in the Mutual Life Insurance Company at Decatur, Alabama, by Rowland J. Compton, electrical contractor.

Five-ton units

Temperature control for the six-story building is supplied with 13 Weathertron package units of five tons each. In this and several other respects the building sets a precedent and marks advanced techniques in commercial air conditioning installations.

First, the building represents an outstanding example of electricity's winning out over another utility on a very carefully figured operating cost to offset a higher initial cost.

Several economies were recognized also in installation of the system. Mr. Compton had installed air conditioning in another building for the insurance company and had the confidence of the owners. This aided him in his effort to get the company to install heat pumps at initial cost of around $5,000 more than the cost of installing gas heat and conventional air conditioning.

Cost comparison

But insurance executives, who figure long range investments in small fractions of percentage anyway, quickly figured that the savings in operating cost would more than offset the additional initial cost. From estimates by GE engineers, local utility and Mr. Compton, it was agreed that the electric bill for heating and cooling

heating economical for office building

by W. M. Massey

could be kept to about $75 per month. A factor entering into the operating cost estimate was the wintertime utilization of heat gain from the slimline ceiling lights on the nine-foot ceilings of the buildings. This averaged out better than three watts per square foot for the lights, and the heat pumps utilize this heat in winter.

Another saving was realized in the water which would have been required for conventional air conditioning, thus requiring three utility bills as compared with one for the heat pump.

Importance of single zone

Mr. Compton strongly emphasized the importance of single zone installation in commercial buildings wherever possible. This was the case with the Mutual building except for the basement and first floor. In this particular instance, on the first floor multiple tenancy exists and there is a printing plant in the basement. For the basement and first floor, three five-ton Weathertrons were installed with one zone for the basement and two for the first floor.

Two five-ton units were installed on each of the other floors on a single zone, each equipped with a thermostat control that permits one unit to heat or cool when the capacity of only one is needed.

Each floor with a single zone system is served with a large supply duct lengthwise of the building, simulating a beam after it was covered with acoustical tile to match the ceiling. Air returns through doors and hallways without ducts as compared with the return ducts that had to be installed from first floor to basement.

Utility rooms are located near the elevator shaft and adjacent to the outside wall. Exhaust and intake ducts for air supply extend through this wall, one over the other, and the intake ducts are equipped with baffle terminals while exhaust ducts are set flush with the outer wall.

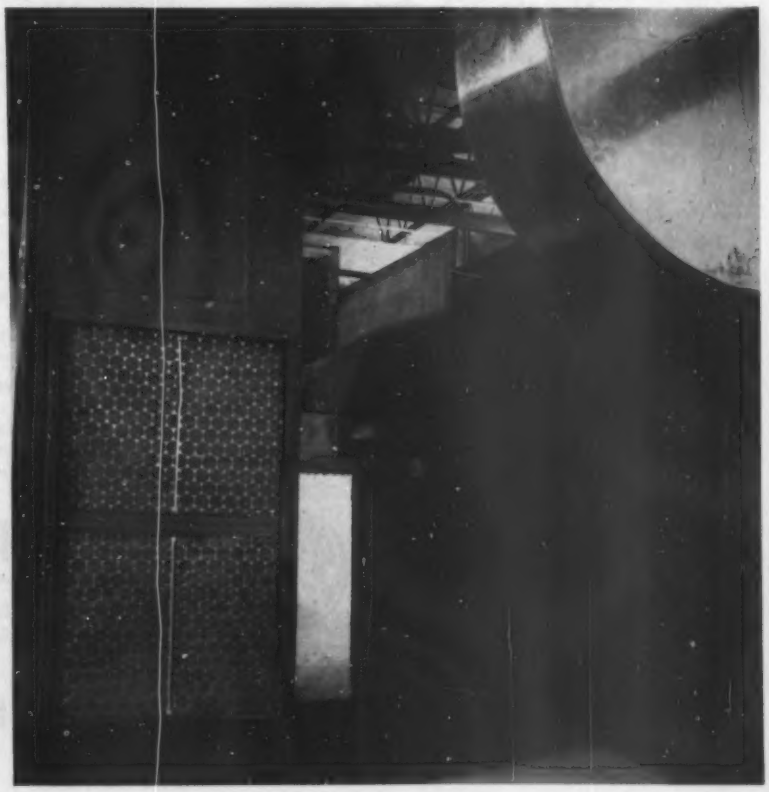
Standard thermostats used

To get two stages of cooling with the two Weathertrons on each of the top five floors, Mr. Compton used a standard Minneapolis-Honeywell thermostat substituting double control mercury tubes in the system inside his own shop.

Conventional wiring was used with conduits from basement run up the elevator shaft to the adjacent utility room on each floor where control panels were placed on the wall next to the shaft.

As Mr. Compton points out this type of installation calls for the minimum amount of ductwork and installation, permits two stages of

(*Continued on page 92*)

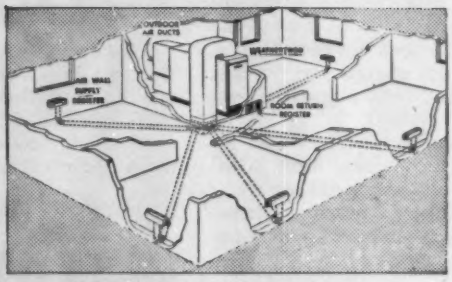


Two of the three Weathertrons and part of the ductwork for the basement and first floor zone system are shown here. Two five-ton units are installed on each of the five other floors, each with a thermostat control that permits the use of only one unit at a time as needed.

NOW! With G.E.'s new Weathertron—

HEATING without Fuel and Cooling without Water!

General Electric's revolutionary Weathertron uses only air and electricity to give you ideal indoor climate 365 days a year



Layout of G-E Weathertron System in basementless house. Double duct to outdoors draws in outside air, then discharges it after use by Weathertron.

IT'S COMPLETELY AUTOMATIC: Just set the thermostat once. Your home or place of business will stay constantly comfortable winter and summer, automatically. The G-E Weathertron is so completely automatic that it switches from heating to cooling and back—from season to season, within the same day, or hourly as needed. No switches to flip, no dampers to turn.

TRULY SELF-CONTAINED: With no water required, cooling towers, wells, ground coils, water piping, condensers and pumps are eliminated.

FOR EXISTING HOMES, TOO: If you have warm air heating, existing ductwork can often be used.

If you use steam or hot water heating, installation of ductwork usually presents no more problem than for conventional air conditioning.

ABOUT COST: *Initial price* is comparable to that of a good automobile. *Installation cost* is moderate, requiring connections for only air, electricity, ductwork, and drain for moisture removed from the air. *Operating cost*, too, is competitive with conventional heating and cooling. G-E Weathertron gives about three units of heat for each heat unit of electricity.

PRACTICAL, DEPENDABLE: G-E Weathertrons, backed by almost twenty years of testing and constant improvement, are today giving excellent service—economically—in home after home all over the U. S. Consult your architect.

G-E Weathertron, a handsome packaged unit, is completely self-contained, completely automatic...all-electric!

WEATHERTRON*

ALL-ELECTRIC HEATING AND COOLING FOR HOMES, STORES, OFFICES

*formerly the G-E Heat Pump

GENERAL ELECTRIC

For Full Information on the G-E WEATHERTRON Call or Write the Nearest Representative shown on Opposite Page

WEATHERTRON

For full information, CALL or WRITE

General Electric Co.
410 Red Rock Bldg.
Atlanta 3, Georgia

General Electric Co.
511 International Trade Mart
New Orleans 12, La.

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Alabama Engineering Corp.
2106 Grant Street
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General Electric Factory Branch
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Thompson Company
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Air Control Associates, Inc.
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Houston, Texas

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Mechanical Equipment & Engineering Co.
a division of West Texas Dist. Corp.
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Southern Equipment Co. Inc.
210-212 W. Commerce Street
San Antonio 6, Texas

Texas Distributors, Inc.
3914 Live Oak Street
Dallas 4, Texas

VIRGINIA
General Electric Supply Company
1505 Sherwood Avenue
Richmond 14, Va.

Richardson-Wayland Electrical Corp.
13th St. at Memorial Bridge
Roanoke 10, Virginia

Dates Ahead

Illuminating Engineering Society, National Technical Conference, Chalfonte - Haddon Hall, Atlantic City, N. J., Sept. 13-17, 1954.

Public Utilities Association of the Virginias, Thirty-Sixth Annual Meeting, Sept. 16-18, 1954. The Greenbrier, White Sulphur Springs, W. Va.

Southeastern Electric Exchange, Engineering and Operation Section, Thomas Jefferson Hotel, Birmingham, Ala., Sept. 23-24, 1954.

American Institute of Electrical Engineers, Electrical Conference of the Petroleum Industry, Mayo Hotel, Tulsa, Okla., Sept. 27-29, 1954.

International Association of Electrical Leagues, 19th Annual Conference, Bellevue-Stratford Hotel, Philadelphia, Pa., Sept. 29-Oct. 2, 1954.

National Electronics Conference, 10th Annual Conference, Hotel Sherman, Chicago, Ill., Oct. 4-6, 1954.

Western Section, IAEI, 50th Annual Meeting, Seelbach Hotel, Louisville, Ky., Oct. 11-13, 1954.

American Institute of Electrical Engineers, Fall General Meeting, Chicago, Ill., Oct. 11-15, 1954.

Florida Association of Electrical Contractors, Annual Convention, Orange Court Hotel, Orlando, Fla., Oct. 15-17, 1954.

Oklahoma Utilities Association, Electric Light and Power Division, Western District Meeting, Duncan, Okla., Oct. 21, 1954; Eastern District Meeting, Ada, Okla., Oct. 22, 1954.

Florida Chapter, IAEI, Joint Meeting with Southern Section, Tampa Terrace Hotel, Tampa, Fla., Oct. 25-27, 1954.

Southern Section, IAEI, Tampa Terrace Hotel, Tampa, Fla., Oct. 25-27, 1954. Conference chairman, R. A. Miller, Tampa.

National Electrical Contractors Association, Annual Convention, Jung Hotel, New Orleans, La., Oct. 27-30, 1954.

Southeastern Electric Exchange, Accounting Section, Roanoke Hotel, Roanoke, Va., Oct. 28-29, 1954.

Southeastern Electric Exchange, General Sales Conference, Roosevelt Hotel, New Orleans, La., Oct. 28-30, 1954.

Southeastern Electric Exchange, Employee and Public Information Section, Roosevelt Hotel, New Orleans, La., Oct. 28, 1954.

Public Information Program, Workshop Conference, Chase Park Plaza Hotel, St. Louis, Mo., Oct. 28-29, 1954.

American Institute of Electrical Engineers, Southern Textile Conference, North Carolina State College, Raleigh, N. C., Nov. 4-5, 1954.

Natl. Elec. Mfgrs. Assn., Annual Meeting, Haddon Hall Hotel, Atlantic City, N. J., Nov. 8-11, 1954.

American Institute of Electrical Engineers, Winter General Meeting, Hotel Statler, New York, N. Y., Jan. 31-Feb. 4, 1955.

Southeastern Electrical Wholesalers Association, Fifth Annual Industry Day Meeting, Atlanta Biltmore Hotel, Atlanta, Ga., Feb. 2-4, 1955. M. L. Tice, Exec. Vice-Pres., P. O. Box 176, Ben Hill, Ga., Tel.: Atlanta Amherst 6182.

Public Utility Buyers' Group, National Association of Purchasing Agents, 24th annual Mid-Winter Conference, the Shamrock Hotel, Houston, Tex., Feb. 13-15, 1955.

Southern Safety Conference and Exposition, Jung Hotel, New Orleans, La., Feb. 27-28, March 1, 1955. W. L. Groth, Exec. Dir., P. O. Box 8927, Richmond 25, Va.

Oklahoma Utilities Association, Annual Convention, Mayo Hotel, Tulsa, Okla., March 24-25, 1955.

American Institute of Electrical Engineers, Southern District Meeting, St. Petersburg, Fla., April 13-15, 1955.

American Institute of Electrical Engineers, Electric Heating Conference, LaSalle Hotel, Chicago, May 10-11, 1955.

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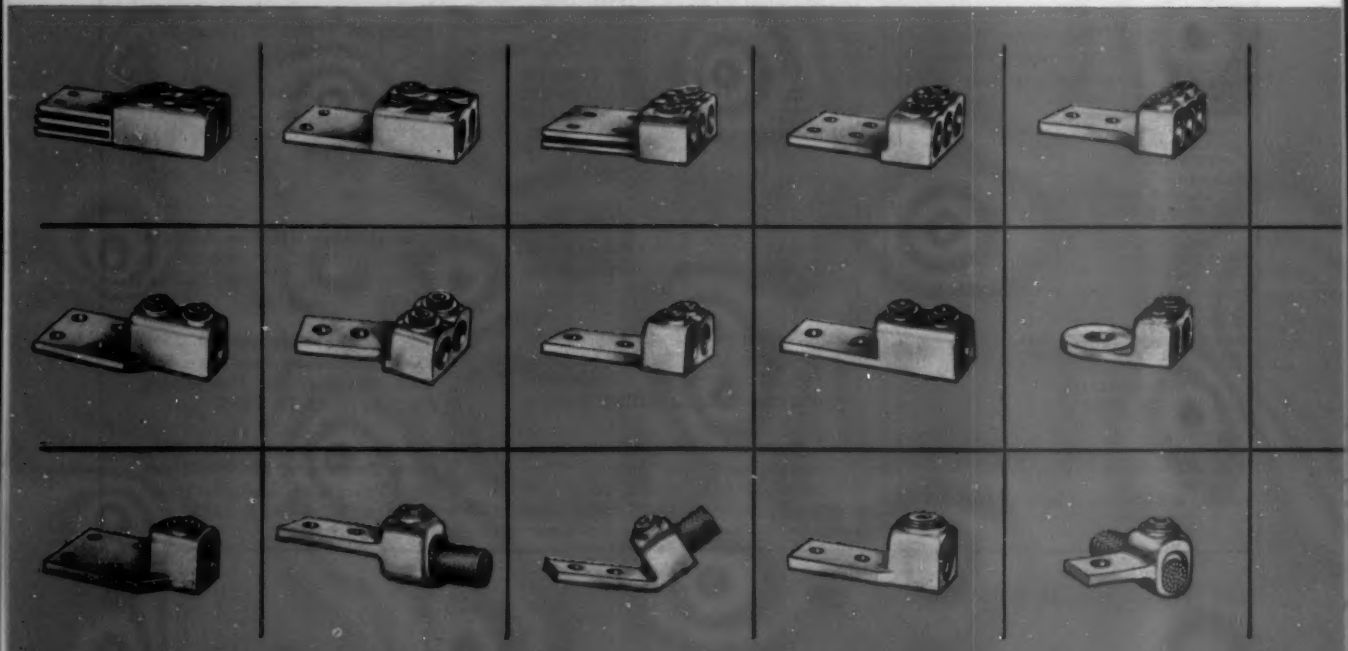

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Electrical modernization in a southern textile mill

by Walter L. Roark, Jr.
Electrical Engineer, Avondale Mills
Sylacauga, Ala.

◆ IN RECENT YEARS there have been numerous advances made toward modernizing the textile mill. As the machinery and processes are modernized, the electrical systems of the textile mills must be modernized in order that the additional loads imposed upon them may be met adequately, safely and efficiently.

As we see it, the heart of the textile mill is its switchgear. From this vital organ flows the life blood of the mill, through its arteries, to each working component of the mill. The working components of the mill will certainly cease to function, when and if "heart trouble" develops. To insure reliable operation, we began our main electrical modernization program with the switchgear.

Installation of switches

During the past five years we have installed six new sets of switchgear in our various plants. Of these, five have been metal enclosed outdoor types and one was a metal enclosed indoor type. All of the switchgear equipment installed has been of the airbreak, drawn out type with a main incoming line breaker and from nine to 18 feeder breakers.

The selection of the main breaker size and its interrupting capacity was carefully made for each substation according to the duty that could be imposed by the substation. Our main breakers are either 4,000 ampere or 5,000 ampere breakers depending on the substation size, while all of them have a 100,000 ampere interrupting-capacity which is, according to our calculation, adequate for any of our existing transformer banks. Cascaded with the main breakers are feeder breakers with 600 ampere ratings and 50,000 ampere capacities.

Each switchgear contains a ground detector and a full complement of totalizing meters with three-phase current metering on the individual feeder breakers. We believe our switchgear is as up to date as possible.

Distribution circuits

Along with modernizing switchgear comes modernization of the distribution circuits. In most cases the old electrical distribution systems consisted of a large number of small circuits radiating from the switchgear where these small circuits were connected in multiple to the oil circuit breakers of the switchgear. These circuits were virtually unprotected since the current rating of the cable was small and that of the breaker large.

In modernizing our distribution system, we found that by carefully analyzing our old circuits we could group some of them into larger circuits and work in complete circuit protection starting at the switchgear. We have found that in most cases the 500 MCM cable has been the most practical size for our main feeders and have installed these main feeders in conjunction with the installation of new switchgear where they were needed.

Plant lighting

There have been many improvements made in mill lighting in the past few years, both as to the quantity of light and as to the electrical distribution of the lighting power.

Not too many years ago a few large oil filled transformers, usually located on the wall outside the mill, furnished all the low voltage power for lighting circuits throughout the mill and the voltage drop in these typical low voltage lighting feeders was high. The light in the mill was furnished either by incandescent bulbs or the old single tube 85 watt R.F. type fixtures.

Increased lighting demand

As the quantity of light needed throughout the mill was increased, the 85 watt R.F. and incandescent fixtures were replaced with the new open fluorescent fixtures which were equipped with either 2-40, 3-40 or 2-85 watt bulbs. At each plant where we have installed planned lighting we have standardized the type of lighting fixture to conform with the most prevalent type fixture already in use. By doing this we have reduced the number of different spare parts that must be carried in stock such as, ballasts, starters, lamps, and lamp sockets. Where fluorescent lighting was altogether new, we used the 2-85 watt open unit.

As lighting levels were raised the power needed for lighting was increased and in some cases was doubled or even tripled. The old lighting circuits had to be replaced with new circuits of greater capacity with shorter runs and less voltage drop. The large oil filled transformers that once hung on the wall outside the plant and furnished power to the entire mill lighting system began to be replaced by smaller dry type transformers that were placed inside the mill as close to their respective load centers as possible.

With the increased number of lighting transformers came the problem of balancing load on the three-phase supply. To cope with this problem, we divided all large areas such as a spinning room or weave room into three equal parts with respect to lighting load and used three dry type transformers,

(*Continued on page 91*)

Here's a new Sylvania
LIGHTING SYSTEM!

High-level over-all fluorescent light . . . and no visible fixtures . . . that's Sylvania's

SYLVAN-AIRE

Two views of SYLVAN-AIRE Lighting System in High Point, North Carolina Library.

This SYLVAN-AIRE System actually serves three purposes.

1. It provides a source of soft but ample over-all light.
2. Made of corrugated, translucent plastic, it imparts a new beauty and character to any room.
3. Designed with alternating acoustical strips or wedges to help hold sound to comfortable levels.

Quick, easy installation and extremely low maintenance costs are other big advantages. For new descriptive literature write to Dept. 4X-2509 at Sylvania.

CONTRACTOR ACCLAIMS SYLVAN-AIRE!

"This SYLVAN-AIRE System opens up many new remodeling possibilities to Lighting Contractors;" says George H. Dobbins, Jr., who handled this installation. "We also appreciate the simplicity of application, and the good business offered by this new system."

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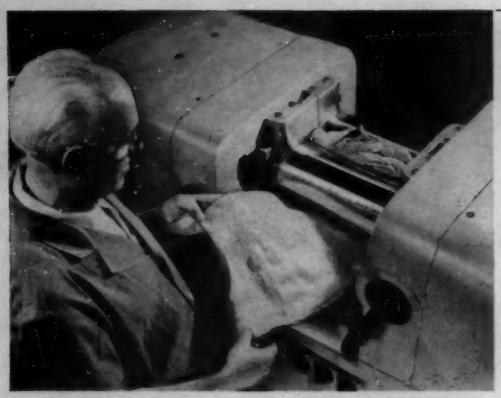
LIGHTING • RADIO • ELECTRONICS • TELEVISION

Don't buy just "Type RR" High Voltage Cable

Phelps Dodge Habirite



Experimental compound of high voltage, butyl rubber insulating material is carefully milled in Phelps Dodge's extensive research laboratory.

Habirite butyl rubber insulation is shown being exposed to severe ozone conditions in one of Phelps Dodge's exacting laboratory tests.

Habirite-Habirprene cable being checked for corona level, an important step in assuring safe operation of finished product.

X-Ray machine used to carefully examine quality of cable insulation, also detects defects, porosity and foreign matter, helps eliminate faulty cable.

-Habirprene

**Rely on this highest quality cable—
it works where others fail**

The term "RR" is just a name, not an assurance of quality. When you order high voltage RR cable, insist on Phelps Dodge Habirite-Habirprene—developed through years of experience in designing and making high voltage cables. Habirite-Habirprene exceeds the trade's highest standards of quality and reliability.

Phelps Dodge Habirite insulation, a specially engineered butyl rubber compound, has a service dependability record unapproached by any other type of rubber insulation. Habirite is greatly superior to old-fashioned insulations for these reasons:

- Much greater resistance to heat and oxidation. This permits a higher temperature rating, with consequent reduction in conductor size and in cable cost.
- Much greater resistance to ozone—present around high voltage equipment.
- Much greater mechanical toughness affording maximum protection against damage from tools, stones and other installation hazards.
- Better electrical properties—giving a greater safety factor in operation.
- Maximum uniformity of finished product—due to controllable uniformity of raw materials.
- Elimination of laminations which cause weak spots—through use of Phelps Dodge extrusion insulating process.

Phelps Dodge Habirprene sheath, a unique neoprene compound, is especially made to be extra resistant to corona, one of the worst enemies of high voltage cable. This *extra resistance to corona* is an exclusive Phelps Dodge feature. It provides a greater safety factor in operation and has contributed to the remarkable reputation and service record of Habirite-Habirprene.

When you specify Habirite-Habirprene, you are assured of getting RR cable with the utmost in safety and durability. Habirite-Habirprene is the result of Phelps Dodge's rigid quality standards, long experience, expert engineering and vast facilities.

PHELPS DODGE COPPER PRODUCTS
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SALES OFFICES: ATLANTA, 903 Candler Bldg.; BOSTON, 20 Providence Street; BUFFALO, 180 Perry Street; CHARLOTTE, 213 West First Street; CHICAGO, 100 West Monroe Street; CINCINNATI, 18 East Fourth Street; CLEVELAND, 816 Superior Avenue, N.E.; DALLAS, 3113 McKinney Avenue; JACKSONVILLE, 33 S. Hogan St.; DETROIT, 28 West Adams Avenue; FORT WAYNE, 4400 New Haven Avenue; GREENSBORO, N. C., P. O. Box 2643; HOUSTON, 3517-19 Polk Avenue; KANSAS CITY, MO., 406 West 34th Street; LOS ANGELES, 6100 Garfield Avenue; MILWAUKEE, 2408 N. Farwell Avenue; MINNEAPOLIS, 5009A Excelsior Blvd.; NEW ORLEANS, 1009 Carondelet Bldg.; NEW YORK, 40 Wall Street; PHILADELPHIA, 1617 Pennsylvania Blvd.; PITTSBURGH, 1532 Oliver Bldg.; PORTLAND, ORE., 1220 S.W. Stark St.; RICHMOND, 113 E. Cary St.; ROANOKE, 3645 Martinel Avenue, Castle Heights, S.W.; ST. LOUIS, 1221 Locust Street; SAN FRANCISCO, 369 Pine Street; SEATTLE, 505 Skinner Bldg.; WASHINGTON, D. C., 14th and "F" Sts., N.W.

Members of the National Bureau of Standards

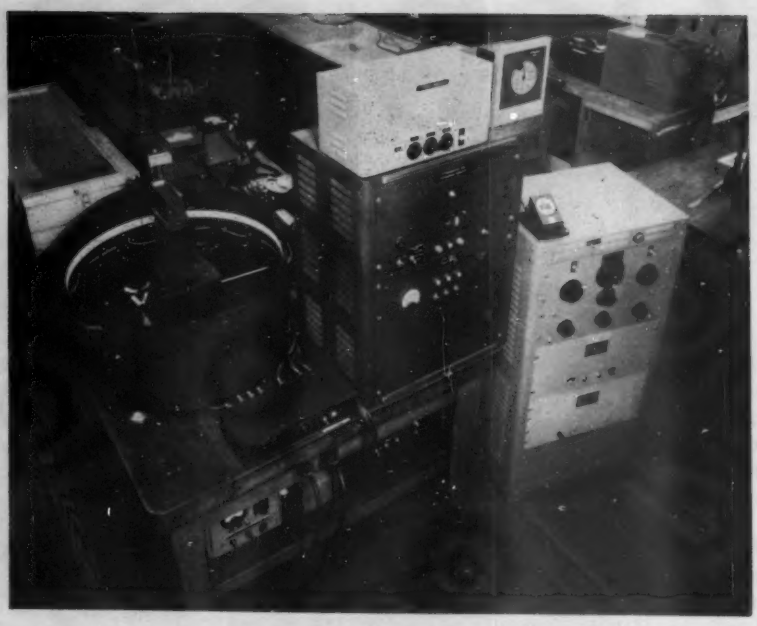
Precise rate measurement

◆ A MORE RAPID method for precisely measuring the rate of alternating-current watthour meters has been developed by T. L. Zapf and A. W. Spinks, of the National Bureau of Standards. This method reduces to a minimum the use of an electrodynamic wattmeter and the laborious process of holding the a-c power constant while the meter registration is accumulating.

In lieu of regular use of the wattmeter for all tests, measurements may now be made by a comparison process that employs a group of carefully selected a-c watthour meters, one of which has been adapted for use as a "standard watthour meter" while the others serve as comparison standards.

Specifically the rate comparisons are performed by comparing the number of revolutions of the disk of the watthour meter under study with that of the standard meter. The standard meter must, of course, initially have had its rate accurately determined by the older wattmeter method.

A watthour meter is essentially an integrating wattmeter in that the time rate of angular rotation of its disk is proportional to the power supplied to the load. Thus, the number of turns of the disk during a certain time interval is proportional to the electrical energy delivered through the watthour meter to the load.



Standard watthour meter setup at the National Bureau of Standards. In the foreground are (left to right) the "standard watthour meter" in its circular housing; the pulse counter and electronic timing and counting circuits which determine accurately the duration of a test run; and the a-c power supply which energizes the coils of the standard or the watthour meter under test. In the background at left is the temperature-controlled cabinet containing the "comparison standard" watthour meters.

Nature of test

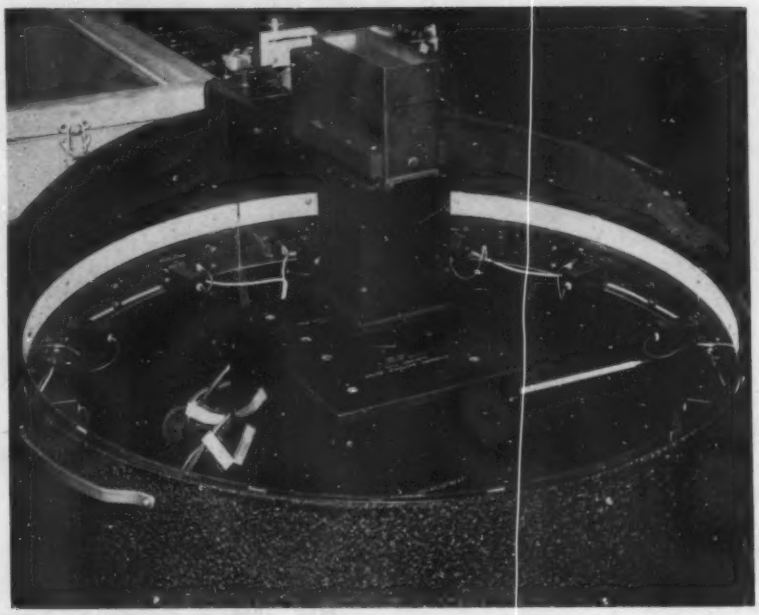
As the custodian of the national standards of electrical measurement, NBS is called upon to standardize high-grade alternating-current watthour meters for various utility companies and manufacturers who use them as standards for the testing of other watthour meters. Such a test consists in determining values for percentage registration of the meter at various combinations of current, voltage, and power factor.

In high-precision NBS tests this has, in the past, ordinarily been done by observing the number of disk revolutions occurring in a fixed time interval during which the power has been held constant. The power is indicated by the deflection of an electrodynamic wattmeter previously calibrated on reversed direct current. This fundamental procedure is capable of high accuracy but is necessarily tedious and difficult.

It has been known for many years that certain individual watthour meters may exhibit remarkable stability over long periods of time. Thus, in an effort to develop a more rapid testing procedure, it was decided to carefully select several watthour meters and to use them as a standard group for

staff have devised a new improved method for

# of watthour meters



Close-up of the new improved standard watthour meter assembly developed by members of the staff and now being used by the National Bureau Standards for the rate-comparison watthour meters. The standard watthour meter with its rotating mirror is in the center of the large cylinder. Above the mirror is the mercury-vapor lamp and lens housing. The phosphorescent scale (white) and the engraved plastic reading scale (below) are mounted near the edge of the large cylinder.

testing other watthour meters by a comparison of their rates.

Selection of standard

The meter selected as a standard is a modified portable commercial watthour meter (rotating standard). This unit has been provided with a shaft extension, and its register has been removed. The meter is mounted in a temperature-controlled box. A light-beam pointer has been provided by mounting a mirror inclined at 45° on the upper end of the shaft. A beam of light incident vertically on the mirror is deflected horizontally to an encircling scale provided with a phosphorescent band.

A phototube is placed behind a vertical slit in the phosphorescent band so that the light beam strikes the phototube once each revolution. The amplified pulse from the phototube energizes an electromagnetically operated mechanical counter for counting the number of complete revolutions of the disk of the standard watthour meter during a run.

A mercury-vapor lamp placed above a small circular aperture serves as the light-pointer source. A lens focuses the image of the aperture on the phosphorescent band. Any current pulse through the lamp will cause a momentary intensification of the light which results in a luminous spot being left on the phosphorescent band. This spot will persist for several seconds; long enough for an operator to note its position on the engraved plastic scale.

Photoelectric test

In one method of operation, the duration of a test run is determined by a photoelectrically operated controller that counts a preset number of complete disk revolutions of the watthour meter under test. This method can be employed if the meter under test is of a type readily adapted to photoelectric pick-offs.

Precisely at the beginning and end of each run the amplified output from the phototube associated with the watthour meter under test triggers an electronic circuit that pulses the mercury-vapor lamp and produces a persistent spot of light on the phosphorescent band. The positions of these two spots can be read to the nearest thousandth of a revolution on the adjacent scale. Any fractional part of a revolution of the standard watthour meter can be computed from these two readings.

Thus, the number of revolutions of the disk of the standard equals the reading of the mechanical counter plus the scale reading at the end of the run minus the scale reading at the beginning of the run. The use of a light beam pointer of this type completely eliminates the friction associated with mechanical registers.

An outstanding feature of the apparatus, when used in this manner, is that the circuit for the starting and stopping of the test run does not depend upon the opening or closing of relay contacts; hence, the run is completely free of relay errors.

Optional method

In another method of operation, the photoelectrically operated con-

(*Continued on page* 90)

Code revision provides air conditioner wiring rules

◆ THE SECRETARY of the National Electrical Code Committee of the National Fire Protection Association announces the release of National Electrical Code Interim Amendment No. 101 effective January 1, 1955. This accomplishes recognition of advances in the manufacturing, use and installation of unit air-conditioning equipment which is promulgated because of an apparent urgent need for basic regulation on account of the rapidly expanding use of such equipment.

The new provisions which the Interim Amendment encompasses were the result of considerable study by a special interim amendment committee of the National Electrical Code Committee, Code Making Panel No. 10, and the Electrical Correlating Committee.

The release of this amendment to the 1953 edition of the National Electrical Code is in accordance with NFPA policy of keeping its standards up to date to furnish guidance in proper installation of equipment and safeguarding of hazards in furtherance of the general objective of the Association to reduce loss of life and property by fire. The present amendment, like other NFPA standards, is the result of action by a representative national committee organized in the general public interest through participation of various important groups concerned.

This amendment, developed under the published Procedure for Tentative Interim Amendments, is recommended by the Committee for application in the administration of the 1953 edition of the National Electrical Code. It is subject to further consideration by the National Electrical Code Committee and official action by the National Fire Protection Association in connection with the next general revision of the National Electrical Code.

Interim Amendment No. 101
National Electrical Code
Effective January 1, 1955

In Article 422, following Section 4286, add a center caption and new Sections 4291, 4292 and 4293 to read as follows: **Provisions for Air-Conditioning Units**

4291. General. The provisions of this section shall apply to electrically energized units and equipment which control temperature and humidity.

4292. Grounding. Exposed non-current-carrying metal parts which are liable to become energized shall be grounded under one or more of the following conditions:

1. if permanently connected to metal-clad wiring;
2. if in a wet location and not isolated;
3. if within reach of a person standing on the ground outside of a building;
4. if in a hazardous location, see Article 500;
5. if in electrical contact with metal or metal lath;
6. if more than 150 volts to ground.

4293. Branch Circuit Requirements.

1. The total load of motor operated air-conditioning equipment shall not exceed 80 per cent of the rating of a branch circuit which does not supply lighting units or other appliances;
2. The total load of air-conditioning equipment shall not exceed 50 per cent of the rating of a branch circuit if lighting units or other appliances are also supplied.

This interim amendment is to be included in the 1954 printing of the 1953 National Electrical Code incorporated in Vol. V of the National Fire Codes published in September 1954 by the National Fire Protection Association, 60 Batterymarch Street, Boston.

Suggested time table for Code revision

◆ THE NATIONAL Electrical Code Committee has announced through its secretary, Charles L. Smith, Chicago, the following suggested time table for the next revision of the National Electrical Code (1956 Edition).

Jan. 1, 1955—Final date for receipt of proposals for revisions.

Jan. - May, 1955—Code Making Panels considering proposals for Code changes and preparing reports.

May 1, 1955 — Panel reports made to Correlating Committee.

August, 1955 — Panel reports published for distribution to Electrical Section members and others interested.

Aug. - Dec., 1955 — Period for study by electrical industry and recommendations to Panels for changes.

Jan. 30, 1956 — Panels make final report to Correlating Committee.

Feb. 16, 1956—Correlating Committee submits proposed changes to NFPA for printing and distribution.

May, 1956 — Review by Electrical Section and NFPA Annual Meeting. Submittal to NFPA Board for approval. Submittal to American Standards Association for status as American Standard.

September, 1956 — Publication of New Code.

Special switches for capacitors

SUCCESSFUL FIELD TESTS of a prototype of a capacitor switch that eliminates the danger of restriking was reported.

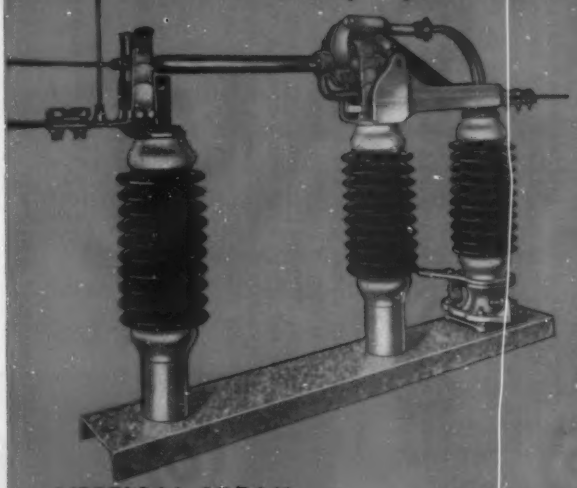
Shunt capacitors, four engineers said in a technical paper, for supplying leading reactive for power factor correction have been used on power systems for a great many

(*Continued on page* 90)

Get easy "summer operation" all winter long with KEARNEY

DISCONNECT SWITCHES

Group Operated Rotating Insulator Type



VERTICAL BREAK

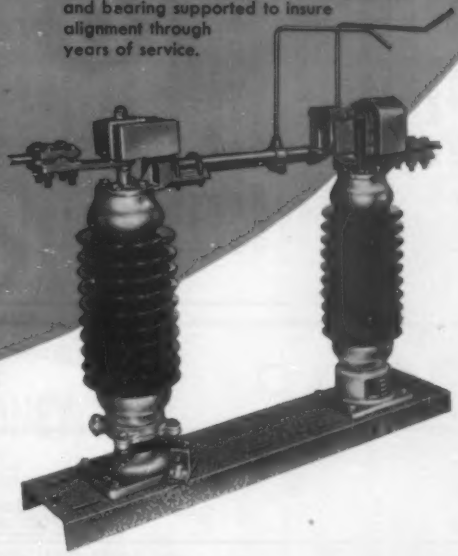
7,500 to 69,000 volts
400 Amps., 7.5 KV to 34.5 KV
600 Amps., 7.5 KV to 69 KV
1200 Amps., 7.5 KV to 69 KV

Only 3 moving parts. Simple, rugged, and completely adjustable for right or left-hand installation.

SIDE BREAK

7,500 to 69,000 volts
400 and 600 amperes

Only 2 moving parts. Heavily constructed and bearing supported to insure alignment through years of service.



Features:

Positive current transfer from blade to line terminals through weather-protected high pressure contacts.

Powerful tubular blade of electrolytic hard drawn copper, balanced and aligned.

Easy adjustment for phase synchronization.

No flexible shunts.

Oilite bearings for easy operation.

Both ends of blade seat in silver overlay contacts. No current transfer through hinge bearings on the rotating switch.

Weather-sealed blade adjustments on side break switch.

Ice-breaking, rotating jaw contact controlled by blade movements on side break switch.

No springs or cams.

For Better Construction — Safer Maintenance

ENGINEERED TO OPERATE UNDER THE TOUGHEST ICING CONDITIONS

When you need them most they're on the job! These trouble-proof switches are ready to operate regardless of weather.

Smooth-operating, cool-running and corrosion-resistant, Kearney Rotating Insulator Switches bring you the utmost in modern disconnect switch performance.

Write today for complete information.

JAMES R. KEARNEY CORPORATION
CORPORATION ST. LOUIS, MO. GUELPH, ONT.

JAMES R. KEARNEY CORPORATION
4224-42 Clayton Avenue • St. Louis 10, Mo.
Canadian Plant: Guelph, Ontario

Specify

KEARNEY Products

250

Estimating Forms—Page 2

THE FORMS previously described are not suitable for home wiring estimates. Many electrical contractors have developed their own forms, but a surprising number are still using the "back-of-an-envelope" method of estimating home wiring prices.

One of the most comprehensive and useful forms for this purpose is available from Westinghouse Electric Corporation, Pittsburgh 30, Pa., at the nominal price of 25c per book of 25 simplified work sheets. This form will not only be found useful in estimating home wiring costs, but will be found to be a great help in selling adequate wiring, since the form for entering data on outlets and branch circuits represents something of a check list of principal electrical applications.

The Home Wiring Estimator consists of a four-page folded sheet attached by perforations to a cost record stub. The forms are bound 25 to a book and the cost record stub stays in the book like a bank check stub.

The first page of the Estimator contains the listing for branch circuit requirements. This consists of a form for lighting load calculations and general purpose branch circuits, small appliance branch circuits, and a check list of individual equipment circuits. At the bottom of this page is a space for drawing in a one-line diagram of load centers and feeders.

Page 2 provides space and forms for entering load data and for calculation of total load. Sections of this page cover general lighting load, small appliance load, individual equipment load, and include space for calculating service equipment and service entrance conductors, as well as special service equipment and feeders when water heater or electrical heating is provided and is to be separately metered.

Forms for calculation of feeders to loadcenters are shown on page 3. These are designed in such a way that it is only necessary to insert load data as previously determined and follow through on the calculations set up in the form to come up with the required feeder wire size. Space is provided for two load center feeder calculations.

Page 4 includes a handy form for totalizing the number of outlets of various types by rooms. The various outlets are listed at left, together with symbol designation. Across the top of sheeet are the various rooms listed by name. At right are columns for total number of outlets, unit cost, and total cost.

The principal advantage of this form is that the job can be planned directly on these estimate sheets. Only figures need be written in for the most part, and all necessary calculations such as calculations of demand, etc., are provided for in the form, in accordance with Code provisions.

NEW WORK

BOXES AND MISCL. OUTLETS
MOUNTED ON WOOD

ITEM	HRS. EA.	LABOR COST INSTALLED EACH AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
Clg. Oublet	.35	.44	.53	.61	.70	.79	.88	.96	1.05	1.14	1.23	1.31
J. Box	.32	.38	.45	.53	.60	.68	.75	.83	.90	.98	1.05	1.13
Wall Rec.	.2	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75
S.P. Sw.	.2	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75
3w. Sw.	.35	.44	.53	.61	.70	.79	.88	.96	1.05	1.14	1.23	1.31
4w. Sw.	.4	.50	.60	.70	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50
Sw.& Plt.Lt.	.3	.38	.45	.53	.60	.68	.75	.83	.90	.98	1.05	1.13
Flr. Rec.	.7	.88	1.05	1.23	1.40	1.58	1.75	1.93	2.10	2.28	2.45	2.63
Range Rec.	.9	1.13	1.35	1.58	1.80	2.03	2.25	2.48	2.70	2.93	3.15	3.38
Range cord.	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75
		MOUNTED ON CONCRETE (INCLUDES DRILLING ACHORS BY POWER)										
Clg. Outlet	.6	.75	.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
J. Box	.55	.69	.83	.96	1.10	1.24	1.38	1.51	1.65	1.79	1.93	2.06
Wall Rec.	.45	.56	.68	.79	.90	1.01	1.13	1.24	1.35	1.46	1.58	1.69
S.P. Sw.	.45	.56	.68	.79	.90	1.01	1.13	1.24	1.35	1.46	1.58	1.69
3w. Sw.	.5	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88
4w. Sw.	.6	.75	.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25
Sw.& Plt.Lt.	.5	.63	.75	.88	1.00	1.13	1.25	1.38	1.50	1.63	1.75	1.88
Range Rec.	1.1	1.38	1.65	1.93	2.20	2.48	2.75	3.03	3.30	3.58	3.85	4.13
Range Cord.	1.0	1.25	1.50	1.75	2.00	2.25	2.50	2.75	3.00	3.25	3.50	3.75

LABOR: COST OF INSTALLING BOX, HANGER (IF REQUIRED) AND MAKING TAPS.

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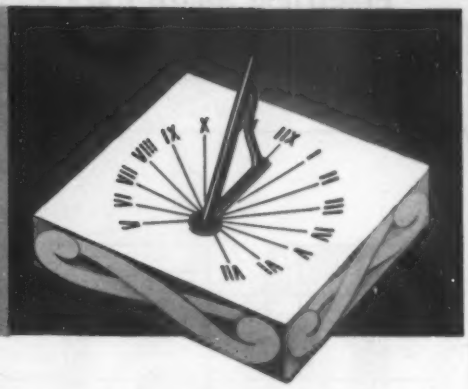
QUALITY

...proved by TIME...



Of course the most convincing proof of Orangeburg's enduring quality is its 60-year record of service to leading Public Utilities, Municipalities and Contractors.

Quality stands out in every feature. Orangeburg Fibre Conduit is lightweight yet strong, tough and resilient. Its impermeable walls and tight joints keep out corrosive ground waters. Its smooth bore and low coefficient of friction protect cable sheaths from abrasion. Orangeburg material resists acids, alkalies, salt, grease and oil.

ORANGEBURG STANDARD is installed with concrete encasement. Preferred for banks of three or more ducts. It has installations in service over 60 yrs.

For these and other advantages Orangeburg provides complete security for electrical services underground. Result...no interruption of power. These vital services keep flowing.

SAVES MONEY, TOO!

Saves by prolonging cable life . . . by faster and easier handling, tooling and laying . . . and by the use of Orangeburg's standard fittings. They cut costs by simplifying installation.

Send to Dept. ES94 for more facts.

ORANGEBURG MANUFACTURING CO., INC.
Orangeburg, New York
West Coast Plant — Newark, California

ORANGEBURG NOCRETE is installed without concrete encasement. Extra heavy wall for direct burial—practical for many single or double duct runs.

ORANGEBURG®
FIBRE CONDUIT

STANDARD INSTALLED WITH CONCRETE

NOCRETE INSTALLED WITHOUT CONCRETE

Graybar ELECTRIC COMPANY

DISTRIBUTORS, ORANGEBURG FIBRE CONDUIT

BRANCHES AND STOCKS IN PRINCIPAL CITIES

GENERAL ELECTRIC SUPPLY COMPANY
A DIVISION OF GENERAL ELECTRIC DISTRIBUTING CORPORATION

CABLE NON-METALIC SHEATHED (BUILDING)
NEW WOOD RESIDENCES

NO CONDR'S. SIZE	HRS. "C".	LABOR COST PER FT. INSTALLED AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
2/14	3.8	.048	.057	.067	.076	.086	.095	.105	.114	.124	.133	.143
3/14	4.0	.05	.06	.07	.08	.09	.10	.11	.12	.13	.14	.15
4/14	4.3	.054	.065	.075	.086	.097	.108	.118	.129	.14	.151	.161
2/12	3.8	.048	.057	.067	.076	.086	.095	.105	.114	.124	.133	.143
3/12	4.2	.053	.063	.074	.084	.095	.105	.116	.126	.137	.147	.158
4/12	4.7	.059	.071	.082	.094	.106	.118	.129	.141	.153	.165	.176
2/10	4.0	.05	.06	.07	.08	.09	.10	.11	.12	.13	.14	.15
3/10	4.5	.056	.068	.079	.09	.101	.113	.124	.135	.146	.158	.169
4/10	4.8	.06	.072	.084	.096	.108	.12	.132	.144	.156	.168	.18
2/8	4.4	.055	.066	.077	.088	.099	.11	.121	.132	.143	.154	.165
3/8	4.8	.06	.072	.084	.096	.108	.12	.132	.144	.156	.168	.18
2/6	4.9	.061	.074	.086	.098	.11	.123	.135	.147	.159	.172	.184
3/6	5.4	.068	.081	.095	.108	.122	.135	.149	.162	.176	.189	.203
2/4	5.9	.074	.089	.103	.118	.133	.148	.162	.177	.192	.207	.221
3/4	6.5	.081	.098	.114	.13	.146	.163	.179	.195	.211	.228	.244

LABOR: INCLUDES DRILLING, CUTTING, INSTALLATION, STRAPPING AND CONNECTING TO BOXES. (NO TAPS)

CONDUIT "IN CONCRETE SLAB" WAREHOUSE

CONCEALED — THINWALL

COND. SIZE	HRS. "C"	LABOR COST INSTALLED PER FT. AT FOLLOWING RATES										
		$1.25	$1.50	$1.75	$2.00	$2.25	$2.50	$2.75	$3.00	$3.25	$3.50	$3.75
1/2"	3.1	.0388	.0465	.0543	.062	.0698	.0775	.0853	.093	.1008	.1085	.1163
3/4"	3.4	.0425	.051	.0595	.068	.0765	.085	.0935	.102	.1105	.119	.1275
1"	4.0	.05	.06	.07	.08	.09	.10	.11	.12	.13	.14	.15
1 1/4"	5.4	.0675	.081	.0945	.108	.1215	.135	.1485	.162	.1755	.189	.2025
1 1/2"	6.8	.085	.102	.119	.136	.153	.17	.187	.204	.221	.238	.255
2"	8.6	.1075	.129	.1505	.172	.1935	.215	.2365	.258	.2795	.301	.3225
						RIGID						
1/2"	3.6	.045	.054	.063	.072	.081	.09	.099	.108	.117	.126	.135
3/4"	3.9	.0488	.0585	.0683	.078	.0878	.0975	.1073	.117	.1268	.1365	.1463
1"	4.6	.0575	.069	.0805	.092	.1035	.115	.1265	.138	.1495	.161	.1725
1 1/4"	6.2	.0775	.093	.1085	.124	.1395	.155	.1705	.186	.2015	.217	.2325
1 1/2"	7.8	.0975	.117	.1365	.156	.1755	.195	.2145	.234	.2535	.273	.2925
2"	9.8	.1225	.147	.1715	.196	.2205	.245	.2695	.294	.3185	.343	.3675

LABOR: INCLUDES INSTALLATION AND CONNECTING TO BOXES, AND INSTALLING TIES. (NO WIRE OR TAPS)

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now available

from FA distributor's stocks for quick assembly on the job

FA T-M thermal-magnetic trip circuit breaker

LOAD CENTERS and SERVICE EQUIPMENT

Approved by the Underwriters' Laboratories, Inc., for label service, these new FA assemblies embody many features that should make them extremely popular with contractors, and builders, as well as ultimate users.

Besides providing safe, dependable, automatic circuit protection against short circuits and harmless and dangerous overloads, these new units are so designed to make the addition of new circuits, changes in capacities and replacement of damaged units a simple, easy task.

Deliveries, too, are facilitated due to the fact that the new units are of the "panel base assembly" type, which means that all components — box, front, panel-back, bus bar and main lug connection — are available in one complete package from FA distributor's stocks for quick and easy assembly on the job.

An outstanding feature of the new unit is the new FA T-M Thermal-Magnetic Trip Circuit Breaker with quick-make and quick-break operation on manual or automatic trip and FA design magnetic blow-out.

The thermal magnetic action of the circuit breaker automatically trips the handle, indicating the circuit in trouble. Service interruptions caused by harmless, momentary overloads are eliminated, due to the time-lag action of the circuit breaker's thermal element.

On short circuits and dangerous overloads, the magnetic trip hastens the action of the circuit breaker. Once the cause of the trouble is removed, service is restored by flipping the handle back to "off" position and then to "on".

Screwless assembly (just slip the breakers in), one pressure type of connection between circuit breaker and bus bar, and "sequence bussing" to balance the load and permit double pole, individual trip combinations are other features.

Four basic combinations to afford a maximum of 4, 8, 12 and 20 poles (all single pole on combinations of single and double pole) are available. These, plus a supply of dependable, individually-packed single and double pole individual trip FA type T-M Circuit Breakers, available from distributor's shelves, meet almost any job requirement.

For contractors and builders, these new FA assemblies all add up to greater convenience, faster deliveries, and quick and easy installation on the job. So include these units on all jobs requiring Load Centers and Service Equipment. For further details, see your nearest FA distributor, or contact a FA representative, listed in Sweet's.

FA T-M Circuit Breakers are available in the following capacities: 10, 15, 20 and 30 amps., 120 volts AC single pole and/or 120/208 volts AC double pole individual trip; 40 and 50 amp., capacity furnished with FA QP Quicklag P Circuit Breaker; main lugs for 100 amp., maximum, 115/230 volts, 3-wire single phase of 120/208 volts, 4-wire three phase mains. (Six circuits or less suitable for service equipment.)

Frank Adam Electric Co.

FA

BOX 357, MAIN P. O.
ST. LOUIS, MISSOURI

Makers of BUSDUCT • PANELBOARDS • SWITCHBOARDS • SERVICE EQUIPMENT • SAFETY SWITCHES • LOAD CENTERS • QUIKHETER

News of the industry

edited for Southern readers

EEI co-ordinates fall farm lighting promotion

"Be Modern — Light Up The Farm" is the theme of Edison Electric Institute's nationally-co-ordinated farm lighting promotion, scheduled for September-October-November.

L. H. Hammond, chairman of EEI's Farm Sales Promotion Committee, said recently that an announcement packet containing promotional pieces for the fall campaign has been mailed to the industry. Behind the new campaign, Mr. Hammond said, is a series of studies showing that farm lighting electric use is 50 per cent behind urban residential lighting.

The announcement packet features eight brochures, mailers and advertising kits for participating company use. This is in addition to the Plan for Action, which outlines the goals of the promotion and specific ways in which companies can utilize EEI-furnished materials.

Among the promotion materials in the announcement packet is "Light for Seeing on the Farm," a 14-page booklet emphasizing the importance of lighting in everyday farm activities. Folders included for campaign use stress yard and general farmstead lighting, and ways to save time and labor with proper lighting. Other materials in the packet include samples of newspaper display advertising on farm lighting and six radio spot announcements for campaign use.

Backbone of the campaign is a new farm lighting slide kit for use by farm electrification speakers. It is announced in the packet by an advertisement, "Farm Lighting is 50 per cent Behind!," taken from the July-August issue of EEI's Farm Electrification magazine.

In a preliminary survey conducted by the EEI Farm Sales Promotion Committee last spring, utilities indicated a need for one-quarter million pieces of promotion material for the fall campaign.

Kansas City wiring campaign announced

Final arrangements for a wiring modernization campaign, organized by the contractor and wholesaler divisions of the Electrical Association of Kansas City, Mo., have been made.

The purpose of the campaign is to provide a means whereby a residential customer living in an established home served by Kansas City Power & Light Co., can modernize any existing wiring from the meter connection, and pay on an installment plan on his light bill over a 36-month period.

All advertising under this proposal will be carried over the name of the Electrical Association. The proposed budget for the first 12 months of the campaign's operation is sizable and will include newspaper, television, radio, car card and direct mail advertising.

Florida contractors plan October meeting

The 1954 Annual Convention of the Florida Association of Electrical Contractors will be held on October 15-17 at the Orange Court Hotel, in Orlando.

The convention dates will avoid any conflict with the convention of the Florida Electrical Inspectors and the National Convention of NECA, both to be held the following week.

Convention Chairman Axel Ornberg, of Curry Electric Company, Orlando, has appointed H. B. Garvin of Garvin Electric Co., Orlando, to handle all matters pertaining to exhibits by manufacturers and manufacturer's representatives.

The Entertainment Committee will have a planned ladies' program in addition to the ladies attending the banquet and dance on Saturday night.

Although the complete 1954 Convention program has not been released at this time, the three-day session will probably consist of: Friday—registration and exhibits; Saturday—principal speakers from the various phases of the electrical industry—luncheon—banquet and dance; Sunday—speakers—convention business session—election of officers.

Industry conference reviews activities

Meeting with the electrical trade press in New York recently, the members of the Conference Group on Co-ordination of Electrical Industry Sales and Promotional Programs reviewed its activities and accomplishments during the first year of its existence and its plans for the future.

Associations represented on the

FIRST A-W CERTIFICATE—Major Pat Kelly of the City of Vicksburg, Miss., on behalf of the newly organized Vicksburg Adequate Wiring Bureau has presented the first Adequate Wiring Certificate to Dr. Ed Evans, Vicksburg new homeowner. Other members of the Bureau present at the ceremonies were Miller Evans, local builder; Arnold Dean, architect; L. P. Ford, City of Vicksburg electrical inspector; Ned Duncan, Mississippi Power & Light Co.; and Dan Cole of B. & G. Electric Co., who wired the home.

A COMPLETE SELECTION OF LIGHTING EQUIPMENT — Just consider the many different installations shown in this typical plant lighting system. Yet, from your local Graybar office you can conveniently order equipment for these or any other lighting applications. See for yourself — you'll save time and paper work when you *call Graybar first.*

Everything you need for LIGHTING JOBS

For extra profits get a Graybar Lamp contract

With a Graybar Lamp Contract you earn more-than-standard discounts, because discount is based on your total volume of purchases ...not individual orders. You invest nothing, and your local Graybar office will see to it that the types and sizes of G-E lamps your customers need are always in stock. Ask for complete information, today!

When your customer's employees see better, they also work better. And, when you base your fixture recommendations *on individual area needs,* you make an important contribution toward more efficient and more profitable plant operation. *And,* you'll help build the kind of confidence in your work that means more jobs in the future.

As distributor of the nation's most complete selection of lamps and lighting equipment, Graybar can therefore offer you and your customers comprehensive help in these vital planning and purchasing stages.

By calling a Graybar Lighting Specialist, you can get absolutely impartial advice on the fluorescent, incandescent, or mercury vapor system best-suited to any particular lighting requirement. You can be sure that the finished installation has been selected with consideration of both initial and operating costs ... that it has been properly applied ... and that it provides adequate over-all lighting intensity.

Graybar also distributes more than 100,000 other electrical items for wiring, power, ventilation, as well as lighting.

Make it a point to call Graybar for everything electrical — it's the easy way to coordinate both purchasing and job-site delivery. *Graybar Electric Co., Inc. Executive Offices: Graybar Building, New York 17, N. Y.*

455-79

CALL GRAYBAR FIRST FOR...

GraybaR ELECTRIC CO., INC.
420 Lexington Avenue, New York 17, N. Y.

GraybaR Everything Electrical

IN OVER 110 PRINCIPAL CITIES

Conference Group include: Edison Electric Institute, International Association of Electrical Leagues, National Appliance and Radio-TV Dealers Association, National Association of Electrical Distributors, National Electrical Contractors Association, and National Electrical Manufacturers Association.

J. Reed Hartman, vice-president of the Cincinnati Gas and Electric Company and chairman of the conference group, acting as spokesman for the inter-industry group, listed the following as the major benefits which have accrued to the associations as a result of the conference group's meetings and activity:

(1) Better understanding of the objectives of the promotional and sales activities of each association represented resulting from across-the-table exchanges of ideas.

(2) Appreciation by all segments of the industry of the problems peculiar to each segment in the formulation and activation of its sales and promotional programs.

(3) Wider dissemination of information within the electrical industry on sales and promotional activities resulting in greater opportunity for the co-ordination of these activities.

Commenting on the foregoing, Mr. Hartman said: "Although these benefits are intangible, they lay the groundwork for future activity. By getting to know each other better and understanding each other's problems more fully, we are following the direct path to our primary goal — the better coordination of industry-wide sales and promotional programs for the achievement of their maximum effectiveness."

Mr. Hartman pointed to the compilation and industry-wide distribution of a pamphlet called "An Inventory of the Sales and Promotional Programs of Six Associations," which, "for the first time, put together in detail the story of what each of us is doing as an organized industry group in the sales and promotional fields, so that each of us can better support the activities of the others and coordinate our activities with theirs."

It is the intent of the conference group to keep this information current and to encourage wider dissemination of information among all segments of the industry, as well as to broaden industry support for these activities.

In this connection and looking into the immediate future, the members of the conference group have unanimously concurred that all segments of the electrical industry must step up the tempo of activities needed to capitalize on the increasing public awareness of the need for adequate wiring.

"We must back up the intensified national effort," Mr. Hartman concluded, "with more aggressive promotion at the point of sale — the local level. The electrical industry locally should organize itself following the patterns of the successful local electrical leagues and adequate wiring bureaus. The electrical industry must tie in locally with national promotions in order to profit more fully from the national programs."

The conference group plans to broaden its base by inviting other national electrical associations to join with it in its discussions.

Dallas Power sponsors huge rewiring program

A PROGRAM expected to produce $15,000,000 worth of rewiring business from existing and overloaded homes in Dallas, Texas, was outlined to an audience of 200—electrical contractors, bankers, home builders, real estate men and appliance dealers — following a dinner sponsored recently by the Dallas Power and Light Co.

P. M. Rutherford, Jr., commercial manager for the company and principal speaker, said the purpose of the meeting was to bring together those segments of business interested in modernizing the wiring in Dallas homes.

"Wiring in nine out of ten homes has been outmoded by the addition of air conditioning and appliances," Mr. Rutherford told his audience.

"It is much cheaper to do an adequate job of wiring than to do piecemeal wiring each time an appliance is added. Rewiring can be financed with a home improvement loan, which requires no down payment and allows 36 months in which to pay."

Emphasis has previously been placed on getting adequate wiring into new homes, he continued, but the new program will encourage home owners, who are remodeling or adding air conditioning and other appliances, to do a complete rewiring job.

Promotional pieces directed to builders, architects, electrical contractors, home loan bankers, real estate dealers, and appliance dealers have been prepared for circulation by the company's advertising division.

A booklet which explains in layman terms the requirements for good wiring also has been printed by the company for mass distribution.

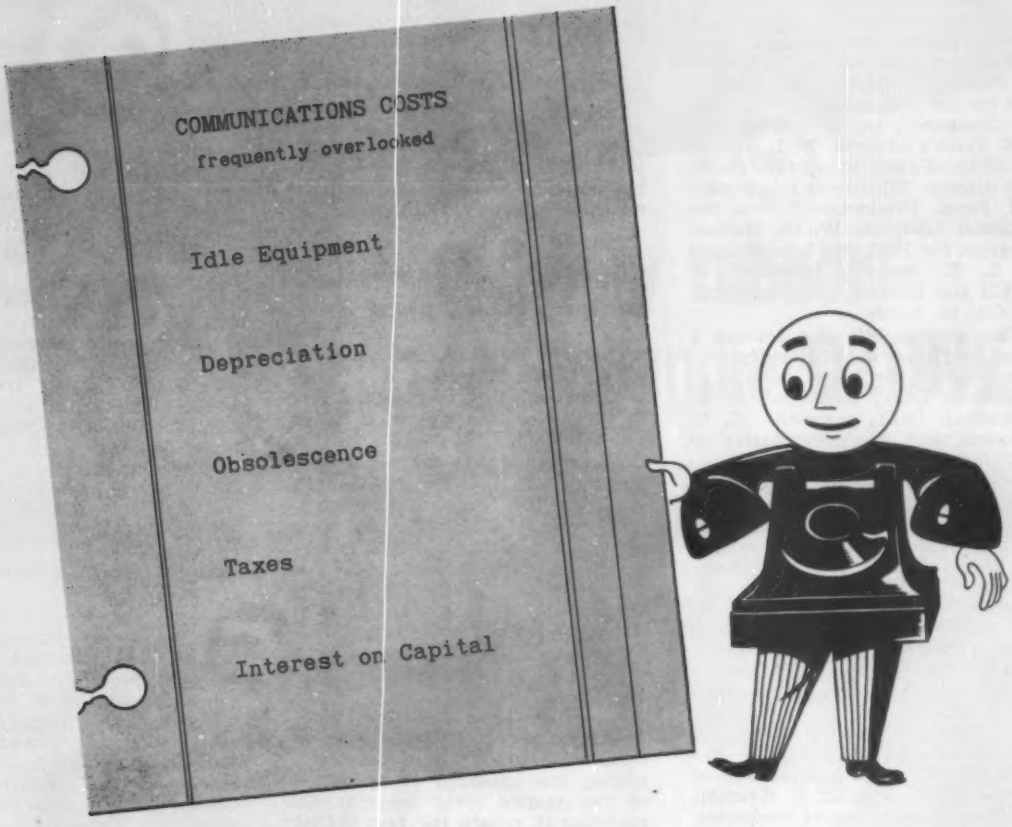
Rutherford said the company plans to increase its newspaper, magazine and radio advertising promoting the wiring story, and that the company's two adequate wiring representatives will continue to work with builders, contractors and home owners.

IAEL annual conference program announced

ANNOUNCEMENT has been made recently of the speakers and plans for the 19th Annual Conference of the International Association of Electrical Leagues to be held at the Bellevue-Stratford Hotel in Philadelphia, September 29 through October 2, 1954.

The afternoon session of the conference's opening day will feature several important speakers who will discuss subjects of interest to the entire electrical industry. George S. Jones, Jr., managing director of the Air Conditioning and

A portion of the more than 200 Dallas electrical contractors, bankers, home builders, real estate men and appliance dealers, who recently attended a dinner sponsored by the Dallas Power and Light Co. A program expected to produce $15,000,000 worth of rewiring business in Dallas was outlined.



BELL SYSTEM TAKES THE HIDDEN COSTS OUT OF YOUR COMMUNICATIONS

The first cost isn't the last cost, when you provide your own communications. Many of the continuing costs are buried deep in idle equipment, taxes, depreciation, loss of interest on capital.

Bell System gives just the service you need—at low cost. It's tailored to your operations today, and flexible to meet possible change tomorrow. Your Bell System communications are efficient and dependable, with new equipment and techniques constantly being developed to improve your service.

When you use Bell System communications, you get the benefits of trained personnel, expert supervision, continuing analysis. This high-quality service doesn't tie up capital but leaves your money free for income-producing investments in your business.

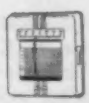
• • •

A complete communications study, made without charge, often shows ways a power company can economically improve service, increase efficiency or create economies. Talk this over with your Bell Telephone representative.

PRIVATE-LINE TELEPHONE

TELETYPEWRITER

MOBILE TELEPHONE


METERING CHANNELS

BELL TELEPHONE SYSTEM

Refrigeration Institute of Washington, D. C., will have as his subject, "Room Cooler Installations, Residential and Commercial." "Diversity Factor in Residential Loads," will be the subject of Detroit Edison Company's assistant controller, A. E. Bush's address. W. J. Ridout, Jr., editor of *Electricity on the Farm*, will discuss "Electrical Equipment and Farm Production," and the National Adequate Wiring Bureau program for 1955 will be discussed by L. E. Barrett, president of NAED and Barrett Electrical Supply Co., St. Louis.

The session will also feature a panel on "Rewiring of Residences." Members of the panel are: E. J. McGinnis, IAEL treasurer; D. E. Rosenthal, IAEL governor; C. C. Simpson, and a representative of a Philadelphia bank.

"The Distributor's Viewpoint" will be discussed by W. G. Peirce, president of Peirce-Phelps, Inc., Philadelphia, at the Thursday morning general session. Other speakers at this part of the conference will be Maxwell Cole, manager of the Market Studies and Service Division of the Philadelphia Electric Co., who will have as his subject, "Industrial Electrification Council," and S. E. Strunk, IAEL governor, the Electrical League of Cleveland, J. S. McDermott, Electric Association of Kansas City, and E. J. Kramer, Electrical Association of Rochester. The latter three gentlemen will take as their subject, "Our Relation With Electrical Maintenance Engineers."

The Friday morning general session will feature addresses by H. C. Huerkamp, sales manager, Westinghouse Lighting Division; E. A. Cornish, director, Research Department, NECA, Washington, D. C.; D. C. Slipher, technical director, Fritz B. Burns Associates, Los Angeles; and LeRoy H. Bennett, manager Northern California Electrical Bureau, San Francisco. Mr. Huerkamp will discuss the "Certified Lighting Program," and Mr. Cornish's subject will be "Trade Educational Programs for Public Benefits." Title of Mr. Slipher's address is "National Association of Home Builders Electrical Standards," and Mr. Bennett will discuss "Promoting Adequate Wiring by TV Programs."

An additional highlight of the Friday morning program will be the scheduled panel on "Residential Electrical Space Heating," which will include David Knoll, vice - president, Berko Electric Manufacturing Corp., Queens Village, N. Y.; L. R. Mast, director of engineering, Electromode Corp., Rochester, N. Y.; and R. D. Graham, commercial engineer, General Electric Co., Providence, R. I.

Feature of the Friday afternoon meeting is the planned panel discussion of league activities, a report of the Industry Coordinating Committee, and IAEL's part in Light's Diamond Jubilee and National Electrical Week.

The Saturday morning session will be open only to representatives of league member organizations for the discussion of IAEL business. The Conference ends at noon on Saturday, October 2.

Cornell-Dubilier opens Sanford, N. C., plant

CORNELL - DUBILIER Electric Corp., South Plainfield, N. J., held a formal opening and open house at their new Sanford, N. C. plant recently.

In attendance were several hundred key industrial, business, civic and professional leaders of state, county and city, who were served a buffet luncheon in the company cafeteria, followed by a conducted tour of the giant capacitor-manufacturing plant. Octave Blake, president of Cornell-Dubilier, and Leslie A. Johnson, vice-president and plant manager, acted as hosts.

Haim Beyer, executive vice-president addressed the visitors on behalf of management, acknowledging the splendid co-operation of the state's civic leaders and pledging in return the best efforts of the company in bringing continued prosperity to the area.

Other officials of the company who were on hand were William Dubilier, 1st vice-president; Paul Deeley, executive vice-president; Clarence Staub, treasurer; and Felix Weiss and Theodore Abeel, vice-presidents.

The Sanford plant incorporates modern industrial plant design and has a windowless manufacturing area with complete air conditioning and daylight illumination from fluorescent lighting.

Facilities and equipment are provided for an expansion potential to some 2,300 employees, and additional expansion has been planned for anticipated future requirements.

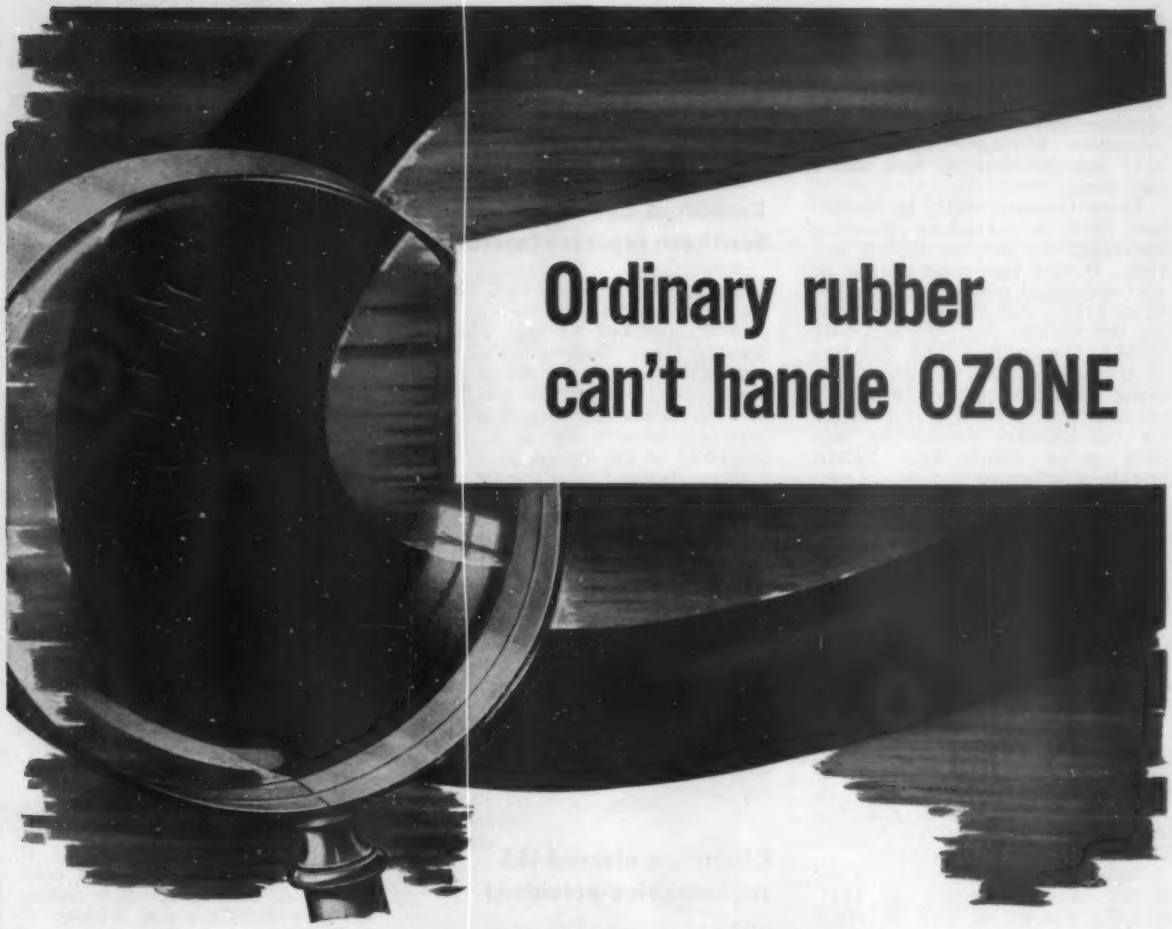
Capacitor-production has begun at the plant after many months of intensive personnel training. Situated on a 27-acre tract, the new plant, part of the Cornell-Dubilier expansion program, provides 275,000 square feet of operating space, including a two-story administration building.

Miller and Wicks get new NEMA appointments

JOSEPH F. MILLER has been appointed assistant managing director of the National Electrical Manufacturers Association, J. H. Jewell, President of NEMA, has announced. Norman Wicks has been appointed manager of the Business Development Department, succeeding O. C. Small, who will become consultant to that department.

Before coming to NEMA in August, 1953, as recording secretary of the NEMA Wire and Cable Section, Mr. Miller had been serving as director of the Copper Division, Metals and Minerals Bureau, of the National Production Authority, De-

SALES AWARDS—B. Merritt, sales manager, Mill-Power Supply Co., Charlotte, N. C., right, presents sales award emblems to Jack Bailey, left, and Warren Jeffries, center. Mr. Jeffries, with Mill-Power since 1940, and Mr. Bailey, with the firm since 1949, were both cited for outstanding sales records. These citations were the first such awards ever made by the company.

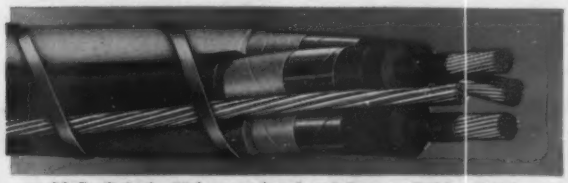


Ordinary rubber can't handle OZONE

You need U. S. GRIZZLY Uskorona-insulated Power Cables

Here's an illustration showing how ozone can chew up a sturdy, rugged cable. This can never happen with United States Rubber Company's famous Grizzly® Power Cables insulated with Uskorona® compound which prevents electrical failure caused by ozone (Uskorona-1 oil base compound or Uskorona-2 butyl rubber compound). Uskorona meets (and in many ways exceeds) the applicable IPCEA specifications for ozone-resistant rubber insulation.

As the only wire manufacturer that grows its own natural rubber, produces its own synthetics and makes its own plastics (as well as the bulk of its own rubber-compounding chemicals and ingredients), United States Rubber Company is able to make certain that only the finest materials are used in the insulations for its wires and cables. These materials are expertly compounded according to methods devised after years of research and experimentation in "U.S." laboratories. Finally, U.S. Rubber's practical "know-how" contributes its important part to the uniform high quality of every "U.S." insulation. This "know-how" is the result of 68 years of successful manufacture of electrical wires and cables, and over a century in the making of fine rubber products.



U. S. Grizzly Uskorona-insulated Power Cable, 5,000 Volts, type RR 3 conductor, shielded, Neoprene jacket.

Send for free catalog giving full information about U. S. Electrical Wires and Cables

UNITED STATES RUBBER COMPANY

ELECTRICAL WIRE & CABLE DEPARTMENT ROCKEFELLER CENTER, NEW YORK 20, N. Y.

US RUBBER

partment of Commerce.

Norman Wicks has been a member of the NEMA staff since May, 1948. He joined the Business Development Department as field representative for the National Adequate Wiring Program, and held this position for two and a half years.

From October, 1950, to December, 1952, he served as recording Secretary for several NEMA sections. During this same period, he was appointed manager of the Defense Production Project, and, during the Korean War, worked with NEMA Committees and Sections on material control problems then being experienced by electrical manufacturers. He was responsible for the Defense Production Bulletin series which kept NEMA members informed of material controls priorities and allocation regulations.

On January 1, 1953, Mr. Wicks was appointed assistant to the managing director, the position he held until this new assignment.

RT&E completes plant, transfers to Waukesha

RT&E Co., formerly of Milwaukee, Wis., announces the completion of a new addition to its Waukesha, Wis., plant and has moved its entire operation to 1900 East North St., in Waukesha.

Although its entry into the industry was as recent as 1947, RT&E's history is one of rapid growth in the production of transformers and developments in the electrical industry.

With larger production space and increased facilities, RT&E plans to be in a position to meet the increased demands for its line of electrical products.

In addition to its line of distribution transformers, RT&E makes one-step regulators and protective equipment. RT&E has also pioneered such developments as 25 KV distribution transformers, externally operated tap changers and radio-noise free bushings for pole type transformers.

Luminous Ceilings adds Southern representatives

LUMINOUS CEILINGS, INC., Chicago, Ill., manufacturers of the Acusti-Luminous Ceiling, has appointed Gene Hagen & Co., who represent them in St. Louis (3719 Vest Ave.), to supervise the Texas and Oklahoma territory, it was announced recently by L. J. Segil, president of the company.

Gene Hagen, Sr., of the company has named the Tom Hodges Company to represent Luminous Ceilings in Tulsa, Okla., and Kansas City, Mo. He also named Del. L. Glidden, Glidden Engineering & Equipment Co., to represent the Lumi-Plastic ceiling manufacturers in Texas.

The Hodges firm has offices at 120 S. Cheyenne St., Tulsa, and at 407 Broadway in Kansas City. Glidden is located at 2111 Hussion St., Houston, Texas, and recently opened a new office at 6115 Denton Dr., Dallas.

Chambers elected IES regional vice-president

JAMES R. CHAMBERS, sales promotion manager of Benjamin Electric Manufacturing Co., Des Plaines, Ill., has been elected regional vice-president, Midwestern Region of the Illuminating Engineering Society. The Midwestern Region consists of 10 states with 10 chapters and sections of the I. E. S. There are approximately 2,000 engineers in this region.

Mr. Chambers is a graduate of the University of Arkansas, and joined Benjamin in 1945 as an application research engineer, having previously served another lighting equipment manufacturer as factory superintendent. In 1951, he was appointed sales promotion manager.

Mr. Chambers has been secretary, vice-chairman and is currently chairman of the Chicago Section of the Illuminating Engineering Society for the year 1953-54. He is currently national chairman of the Industrial Lighting Committee 1953-54, and member of the U. S. National Technical Committee, Industrial Lighting for the Commission Internationale De L Eclairage (International Commission on Illumination.)

Butcher named Northeast Texas NECA chapter head

W. ERNEST BUTCHER, Butcher Electric Service, is the new president of the Northeast Texas chapter of NECA, Dallas, Texas. He succeeds L. G. White, Jr., who becomes a member of the board of directors.

Other officers chosen in the recent election are:

Roscoe E. Libecap, Libecap Electric Co., vice-president; L. E. Chick, City Electric Co., treasurer. H. E. Acklin and Henry Gable, of companies by those respective names, are new directors and Whitley C. Fuller, Electrical Contracting and Maintenance, is a holdover director.

Lawrence Martin continues as chapter manager.

Miller Company creates new Custom Department

THE MILLER CO., Meriden, Conn., announces the creation of a Custom Department for the manufacture of lighting fixtures to customer's design and specifications as developed by architects and consulting engineers. This custom work will be done by skilled craftmen upholding a tradition of more than a century of fine workmanship, supplementing the company's over-all production of fluorescent, incandescent and mercury lamp fixtures for industrial and commercial requirements.

Wherever specialized lighting is needed for specific requirements in design and lighting effects, Miller custom lighting can be built to furnish precisely what is wanted, by producing to designs which have the desired element of style, decor or utility.

The Miller Company's Custom

RT&E Company's new home at 1900 East North St., Waukesha, Wis. The firm recently completed a move from its original headquarters in Milwaukee, and is now equipped with larger production space and increased facilities.

TYPE GA-H—CABLE TO H-BEAM FENCE POST—*This grounding connector joins wide range of standard H-beam posts to fence fabric and cable. Range of cables easily accommodated. Sizes available for grounding more than one cable. One-wrench installation.*

TYPE GD—2 CABLES TO PIPE
Clamp-type ground connector for joining range of two equal cables or single looped cable to pipe or column. Especially convenient for grounding fence posts. Wide range of sizes.

TYPE GX—CROSSED WIRES OR CABLES—*Simple, rapid connection, easy to inspect. Recommended for crossing ground conductors in order to secure greatest efficiency in reducing voltage gradient. Connector takes wide range of sizes.*

TYPE GB—CABLE TO FLAT SURFACE
Connects wide range of ground lead cable to flat structural or equipment surfaces. Can be furnished with larger than standard size bolts for pre-punched holes in steel work. One-wrench installation.

TYPE GP—2 PARALLEL CABLES 90° TO GROUND ROD—*Clamp-type connector joins two parallel cables at right angle to ground rod, pipe, or column. Accommodates range of cable sizes in each groove.*

TYPE GAR—CABLE TO ROD OR PIPE...PARALLEL OR 90°
Double-purpose ground connector—joins ground bus to rod or pipe either parallel or at right angles. Easily installed by tightening two nuts on U-bolt. Accommodates wide range of cable.

TYPE GK—3 EQUAL CABLES TO GROUND ROD OR PIPE—*This connector is frequently used to join grounding conductor, grounded member, and looped ground bus, at one point. Accommodates wide range.*

TYPE GS—BRAID, BAR, LEAF, OR CABLE TO PIPE—*Joins flat flexible braid or copper bar to ground pipes, fence posts, and columns. Highly effective for grounding operating rods, switch handles, gate posts. Can be used with stranded cable by splaying ends under clamp.*

TYPE YA (HYLUG)—GROUND CABLE TO FLAT BAR—*Compression connector—one-piece terminal, easily and economically installed with Burndy portable Hypress. Available for #8 str. to 1000 Mcm.*

9 sound solutions to the problem of

GROUNDING

Engineered to the same precise standards as connectors that carry continuous current loads . . . Burndy grounding connectors can be depended on to provide permanent protection against

• ARC-OVERS • ELECTRICAL LEAKAGE
• LIGHTNING • DIRECT SHORT CIRCUITS

These nine designs are available in 30 variations for connection to driven rod, pipe, cable, fence post, structures, lamp standards.

Send for the Burndy Grounding Catalog, which offers an interesting technical discussion on approved techniques, methods, and materials for proper grounding.

BURNDY

NORWALK, CONNECT. FACTORIES: NEW YORK, CALIFORNIA, TORONTO EXPORT: PHILIPS EXPORT COMPANY TORONTO, CANADA 54-1

Department has been planned to be versatile. Miller engineers can start from a preliminary sketch and develop the finished design—or make an analysis of a finished design and, if necessary, suggest modifications of design details calculated to improve performance without sacrifice of harmony in decor.

For convenience in getting preliminary ideas on paper, a sketchbook in standard file size has been made available. It presents various items which have been manufactured by the Miller Custom Department, along with a pad of single-folded graph form sheets with 10 x 14 inches of sketching area. These kits can be obtained by sending a request on your company letterhead to Miller.

Wood retires as Vepco executive vice-president

WILLIAM E. WOOD has retired as executive vice-president of the Virginia Electric and Power Co., Richmond, Va., ending 47 years of service in the utility business.

A native of South Carolina, Mr. Wood graduated from Georgia Tech in 1907 with a degree in electrical engineering. He was employed following graduation by Stone

W. E. Wood

& Webster in Boston, Mass. and shortly thereafter became superintendent of the Jacksonville, Fla., Traction Co. In 1916, he was transferred to Texas and served in various capacities with properties under Stone & Webster management. He was appointed manager of the Houston Electric Co., and the Galveston - Houston Electric Railway in 1920, remaining there until being moved to Richmond, Va., in 1925 as operating vice-president of the Virginia Railway and Power Co., which had just been acquired by Engineers Public Service Co. The name of the company was subsequently changed to Virginia Electric and Power Co., and Mr. Wood was elected its president in February, 1927.

In November 1929, Mr. Wood was elected vice-president of the parent company, Engineers Public Service, in New York and held that position until 1941, when he left to accept the presidency of the Virginia Public Service Co. He became executive vice-president of Vepco when it merged with Virginia Public Service in June, 1944.

During his career as a public utility executive, Mr. Wood served on many standing committees of the former National Electric Light Association and the present Edison Electric Institute and was at one time president of the American Transit Association.

He has been well known in recent years for his pioneering work in the field of employee relations, and was instrumental in the creation of the Public Utility Executive Course now being given at Georgia Tech.

Mr. Wood will continue to serve on the board of directors of Vepco.

Electrical contractors reorganize in Columbia

THE ELECTRICAL Contractors Association of Columbia, S. C., has reorganized.

At a meeting held recently these officers were elected: Eddie Williams, Cashion Co., president; R. A. Milam, Sr., Milam Electric Co., vice-president; and J. A. Nunamaker, Nunamaker Electric Service, secretary-treasurer.

The purpose of the organization is to promote better relations among contractors, suppliers, city inspectors and power companies, and to promote more adequate wiring for residential and business property.

Southland Sales Agents secure Porcelain line

SOUTHLAND SALES AGENTS, P. O. Box 165, Memphis 1, Tenn., have been named to represent Porcelain Products, Inc., Parkersburg, W. Va., in the western part of Tennessee and in the entire State of Arkansas, according to a recent announcement by Edward D. Plesec of the West Virginia manufacturer.

Fred C. Todd is manager of Southland Sales Agents. He is assisted by James O. Graves, who serves the firm as field engineer.

Southland Sales will represent the firm in the sale of special high voltage electrical porcelain, contacting electrical manufacturers in their territory, as well as act as sales representatives for the entire Porcelain high voltage line.

Gulf group joins Florida contractors

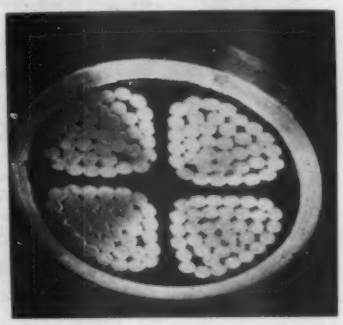
AT A RECENT meeting, the Gulf Electric Contractors Association (Panama City-Tallahassee area) voted unanimously to become affiliated with the Florida Association of Electrical Contractors, effective immediately.

Officers of the local association are: H. O. Freeman, Jr., president; Marion M. Harrison, vice-president; and Gordon S. Hill, secretary-treasurer. Mr. Harrison is also director of the State Association for the Panama City-Tallahassee area.

GC plans direct-extruded aluminum sheathed cables

PLANS of the General Cable Corp., New York, N. Y., to provide industry in the United States with this country's first direct-extruded aluminum sheathed cables, were announced recently by Irving T. Bennett, chairman of the board and chief executive officer, and J. R. MacDonald, president.

The two General Cable officials revealed they have completed arrangements for the purchase from a leading West German firm of an aluminum sheathing press of a



Shown above is a cross section of European low voltage power cable, aluminum sheathed by the direct extrusion process to be introduced in the United States by General Cable.

type which has been commercially successful in extruding aluminum sheathing directly onto an insulated cable core. Preparations are now proceeding for the installation of the press in one of General Cable's plants in the Eastern United States.

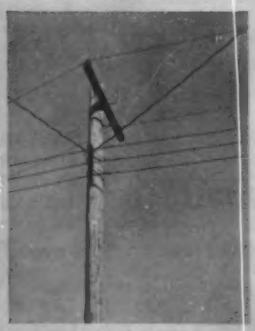
They predicted also that the new aluminum sheathing process might make possible new designs of very high voltage overhead power cables, lighter communication cables for aerial installations, im-

Triplex Self-Supporting Secondary and Service Drop Cable—Regularly supplied with stranded or solid all-aluminum power conductors, insulated with RoPrene (Neoprene) and incorporating ACSR or other suitable bare neutral messenger. All-aluminum, copper or copperweld messengers also available. RoLene (polyethylene) insulation available in place of RoPrene.

Rome Triplex Service Drop Cable provides neat, clean looking installation in new home area.

Triplex is ideal for replacements on older houses too, particularly where eaves and roofs pose space problem.

Rome Triplex is less subject to damage by storm and falling tree limbs.



Installation at pole and house is easy and quick, cutting costly man-hours and permitting less expensive hardware.

Pole costs cut up to 50% with Rome Aluminum Triplex

Applications of Rome Aluminum Triplex secondary and service drop cable show several outstanding cost advantages over conventional bare or weatherproof open wire construction.

For one thing, by proper mechanical design it may eliminate one-third to one-half the number of poles normally required for conventional open wire secondaries. This adds up to a substantial saving. It is also possible to utilize mid-span connections for service drops.

Rome Aluminum Triplex is particularly desirable for new residential developments. It is neat in appearance while mechanical design and light weight minimize sag tendencies. This cable construction, with its strong messenger, also affords greater protection against wind and ice loading damage.

Fewer accessories are needed for secondary and service drop connections than for open wire. Maintenance is less costly; conductors are easily accessible.

Longer service life is assured because of mechanical design. RoPrene (Neoprene) and RoLene (polyethylene) insulation have exceptional resistance to weather and all climatic conditions. There are no braids to rot or festoon. Replacement is minimized.

So whether it's secondary or service drop cable or weatherproof wire for distribution, Rome Aluminum offers you a host of advantages. Bulletin RS-5 tells the story—write for it today.

Rome Weatherproof Wire

Regularly supplied with solid or stranded all-aluminum or ACSR conductors, covered with RoLene or RoPrene. Conventional URC triple braid covering can also be supplied.

Do It Better—Do It Electrically
National Electrical Week, October 18-25

Rome ALUMINUM

ROME CABLE CORPORATION, ROME, N.Y., AND TORRANCE, CALIF.

proved television (coaxial) cables, and quite possibly longer spans.

The first use in the United States of aluminum-sheathed cable occurred in 1932 when 8,000 feet of ⅛-inch diameter telephone cables were installed on each of the dirigibles Akron and Macon. In 1952 the Atomic Energy Commission utilized aluminum - sheathed coaxial cable at its installations at Las Vegas and Eniwetok, most of which was imported from Germany. Aluminum-sheathed cable is also receiving consideration for use in the continental defense warning system.

Alabama Electric named A-C motor service shop

ALABAMA ELECTRIC CO., 215 East Troy St., Dothan, has been appointed a certified service shop for Allis-Chalmers motors, controls and transformers in Barbour, Henry, Dale, Coffee, Houston, Geneva, Covington, and Escambia counties in Alabama.

The firm has been a distributor for Allis-Chalmers motors, generators, transformers, controls, and "Texrope" drive equipment since December, 1953.

Richards appoints two Southern representatives

THE APPOINTMENT of two Southern representatives for their line of switch and outlet boxes and covers, conduit fittings and other electrical specialties, has been announced by the J. R. Richards Co., Carnegie, Pa.

The Walter S. Nash Co., 2101 Tula St., N. W., Atlanta, Ga., has been appointed Richards' representative in the states of Alabama and Georgia. This firm was established in 1951 by Walter S. Nash.

The W. H. "Jack" McAdams Co., 7211 Inwood Rd., Dallas 9, Texas, has been appointed to represent Richards in the states of Texas and Oklahoma. W. H. McAdams heads the Dallas firm.

Gearhart Co., Atlanta, opens district offices

THE GEARHART CO., Atlanta electrical representatives, has reorganized its operations. Three district offices have already been opened and a fourth is contemplated for late this year.

D. E. Park operates the firm's Florida office in Jacksonville; Kirkwood Otey handles the South Carolina office at Sumter; and the Alabama office in Birmingham is under the direction of J. K. Spader, Jr. Upon completion of training, R. H. Osgood, Jr., will open another Gearhart district office at a location to be announced later.

E. G. Riley continues to handle the Georgia operations from the firm's home office in Atlanta.

New GE service branch to open in Tampa

PLANS for the establishment of a new order service office and warehouse for the General Electric Company's Lamp Division to be located in Tampa, Florida, were announced recently by D. O. Critchett, manager, Atlanta Service District, G-E Lamp Division.

The manager for the new service office, which represents another expansion of G-E's activities in the Southeast, will be A. David Carlson, who for the past 16 months has been the assistant manager here in Atlanta.

Mr. Carlson joined G-E as an Activities Supervisor in Pittsburgh, Pa., following his graduation in 1948 from Allegheny College. He was then appointed to the traveling auditing staff, and from there, was assigned to the Service Operation Department at the Lamp Division headquarters in Nela Park, Cleveland, Ohio. In April, 1953, he moved to Atlanta, where he has served as assistant manager.

The building for the new center, now under construction, will be located at 815 North 26th Street, Tampa, and the formal opening is planned for about the first of October. A complete line of lamps will be stocked to service accounts throughout Florida and several counties in South Georgia.

Electro Silv-A-King adds Texas sales representative

THE R. A. PUTTERMAN CO., 2711 Harrisburg, Houston, Texas, has recently been appointed Southern Texas district sales representative for the Electro Silv-A-King Corp., Chicago, Ill., and Bridgeport, Conn.

Robert Putterman, who heads the company, received his degree in electrical engineering from the University of Wisconsin, and has been in Houston contacting architects, electrical contractors, electrical wholesalers, engineers, and industrial concerns since 1948.

Mr. Putterman, before organizing his own company June 30, 1954, was with the W. B. Schnorbus Electric Co., and most recently with the William E. Brice Co.

Here's "A la Carte" Service at "Blue Plate" Prices

Light & Power fluorescent fixtures are made in our own plant from start to finish . . . not merely assembled there. That's why we are among the few equipped to assist you in planning and research on specific jobs—and then go ahead and manufacture the complete fixtures to your particular requirements.

For the quality of "a la carte" fixtures at "blue plate" cost, write or wire today for our catalog and prices.

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LIGHT & POWER UTILITIES CORP.

1035 Firestone Blvd. Memphis, Tennessee

In electrical installations *where QUALITY counts* use CONDULETS*

Quality does count in practically every electrical conduit installation that you make. When you use CONDULETS you know that you are putting in electrical equipment of the highest quality, because CONDULETS have been doubly tested . . . in the factory and in the field.

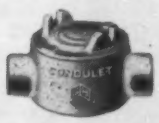
Crouse-Hinds quality control assures a long-lasting product and field records prove it by the test that only time can give. Thousands of CONDULET installations are still in tip-top condition after twenty, thirty, or even more than forty years of dependable service.

The illustration at the right shows four of Crouse-Hinds' basic quality features that are common to all CONDULETS. The fifth, Wedge Nut Fasteners, is an exclusive Crouse-Hinds feature that has made Obround CONDULETS preferred by electricians everywhere.

Type EVA Explosion-Proof Lighting Fixture

Type ARE Arktite Receptacle Equipment

Type FS Condulet With Pilot Lamp Receptacle, Switch and Plug Receptacle



Type GUAC Explosion-Proof Junction Condulet

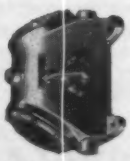
1. **Taper tapping.** Condulet threads are taper tapped to match tapered conduit threading. Makes a rigid joint that will not loosen. This assures permanent ground continuity . . . important for safety.
2. **Integral bushing.** A smooth rounded surface protects wire insulation.
3. **Material.** Feraloy . . . a special alloy that is strong and tough, resists corrosion, and gives sharp, full threads
4. **Finish.** A triple treatment provides long-lasting protection . . . exceeds Federal and U. L. specifications.
5. **Wedge Nut cover fastener.** Clear cover opening . . . no projections. No loose parts . . . Wedge Nuts and screws self-retained. No screw holes to align.

More than 15000 items are listed in the Condulet Catalog including a complete explosion-proof and dust-tight line for use in hazardous locations.

On your next job, use CONDULETS . . . they're made right to last longer.

**CONDULET is a coined word registered in the U. S. Patent Office. It designates a product made only by the Crouse-Hinds Company.*

Type VC Vaportight Industrial Lighting Fixture



Type FLF Explosion-Proof Manual Motor Starting Switch Condulet

Type EPC Explosion-Proof Motor Starter and Circuit Breaker Condulet

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CROUSE-HINDS COMPANY
Syracuse 1, N. Y.

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NEW!

DOSSON "F"

SPLIT BOLT CONNECTOR

For:

taps, dead-ends, service entrances, motor leads, junction boxes, ground wire-to-neutral connections

Fabricated from high strength alloys, all component parts of the new Dosson "F" Connector are cold formed, insuring consistent uniformity and high quality. Can be used economically over and over again!

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SINCE 1904

News about people

Appointment of **William Stone Leake** to succeed **Harry H. Blakeslee** as manager of the Louisiana-Mississippi field sales area for the **General Electric Company's** Apparatus Sales Division has been announced by C. L. Redd, manager, Southeastern District. Mr. Leake's appointment is effective September 1, at which time Mr. Blakeslee will retire after 43 years service with the company.

Mr. Leake, with headquarters in New Orleans, will be responsible for

W. S. Leake

the sales and engineering force throughout the two-state area, which includes four territorial sales offices located in Alexandria, La.; Baton Rouge, La.; Gulfport, Miss.; and Jackson, Miss.

A veteran of 30 years with General Electric, Mr. Leake joined the company in 1924. After completion of G-E's test and sales course, he was assigned to the New Orleans office where he has served throughout his G-E career as a sales engineer, and since March of this year, as manager-sales of that office.

Otis O. Rae, vice-president in charge of the **Westinghouse Electric Corporation's** Southeastern Region, has announced the formation of a new regional sales district, to be known as the Central-Southern District, with headquarters in Birmingham, Ala. Manager of the new district will be **J. M. Oliver,** of Birmingham.

At the same time Mr. Rae announced the appointment of **R. F. Wright,** formerly branch manager of the New Orleans office, as assistant to the vice-president. Mr. Wright will maintain his headquarters in New Orleans and will handle special assignments. **J. H. Bennett** will be New Orleans branch manager, succeeding Mr. Wright.

The newly-formed Central-Southern District will combine the areas previously included in the territories of the Birmingham and New Orleans branch offices, Mr. Rae said.

Mr. Oliver, the new District manager, comes to this position from that of branch manager of the Birmingham office. A native of Dadeville, Ala., he is a graduate of the Alabama Polytechnic Institute. He joined Westinghouse in 1920 as a member of the company's student training course and in 1921 was assigned to the Southeastern Region as a salesman in the Birmingham office. He subsequently was named Birmingham branch manager.

Mr. Wright is a native of Houston, Texas. and a graduate of Clemson College. He joined Westinghouse as a graduate student in 1916 and served in various sales capacities and locations in the Southeastern Region until 1944 when he was assigned to the Westinghouse Electric International Company in Washington and New York. In 1946 he was appointed branch manager of the Chattanooga, Tenn., office where he remained until 1947 when he was appointed New Orleans branch manager.

J. H. Bennett, successor to Mr. Wright as New Orleans branch manager, is a graduate of the University of South Carolina. He joined Westinghouse in 1930 but was away from the company from 1931 to 1934. In 1936 he was transferred to the Southeastern Region where he served in various sales posts. Since 1948 he has been assigned to the Jackson, Miss., sales office as a sales engineer, the post he held until his new appointment.

D. A. Hills has been appointed Southeastern representative and sales engineer for Luminous Ceilings, Inc., Chicago, in the states of Georgia, Florida and part of Alabama, with headquarters in Atlanta at 590 Sherwood Rd., N. E.

Mr. Hills comes to Atlanta from the

D. A. Hills

company's New York sales staff. He is a graduate electrical engineer with

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Size 6' x 4'

DEALER COST OF FIXTURES	$ 99.95*
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TOTAL 21 FIXTURES... RETAIL VALUE... $149.75

Moe Light will give you absolutely free—1 M-1222 32/22 W White & Chrome Instant Start Circline and 1 M-1231 32 W All Chrome Instant Start Circline (Retail Value $30.20).

This offsets the $29.95 cost of the display board.

MOE LIGHT OFFERS YOU EVERYTHING FROM COUNTER DISPLAYS TO COMPLETE HOME LIGHTING CENTERS

No matter which of these display deals you order, Moe Light will offset the cost of the display with FREE merchandise.

M-5052 Moe Light Home Lighting Center
Includes 105 Fixtures, plus display.....$555.00*

M-5054 Moe Counter Display
Includes 16 Fixtures, plus display.....$39.90*

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*Prices Slightly Higher Denver and West.

PUT LAZY WALL SPACE TO WORK WITH THIS MOE MERCHANDISER

Size 4' by 3'. You get 19 fixtures for $70.95* having a retail value of $105.90. The board costs you $18.95. Moe Light gives you absolutely free...1 M-1222 32/22 White and Chrome Instant Start Circline (Retail Value $18.95). *This offsets the $18.95 cost of the display board.*

MOST EFFECTIVE SELLING AID EVER OFFERED FOR $1.00

Put a copy of "Your Home and *Inspiration-Lighting*" on your counter and watch your sales increase. This 32 page book beautifully illustrated in glowing full color SELLS...it tells a convincing story with glamorous room settings, technical information, complete information on how to decorate with light. Send for your copy today.

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- ☐ Send me complete information on Moe Light Display Deals.
- ☐ Have your representative call on me.
- ☐ Enclosed find $1.00 for "Your Home and *Inspiration-Lighting*." If I am not completely satisfied with the book, I may return it to Moe Light within 10 days and receive a full refund.

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professional engineering license in the State of New York and has had many years of experience in lighting design, construction, and sales, as well as in other phases of the electrical industry.

M. O. Hollis, secretary-treasurer and general manager of **Raybro Electric Supplies, Inc.,** Tampa, Jacksonville, Miami, St. Petersburg and Orlando, has announced promotions and personnel changes as follows:

George N. Jack, who has for the past year and a half been manager of the St. Petersburg branch, has been promoted to manager of lighting sales for the state, with headquarters in Tampa. Mr. Jack has been with the Raybro organization since October 1947 and has worked in various capacities, including territory and lighting sales. He has had considerable experience in the lighting field and is at present secretary of the Florida Chapter of I. E. S.

W. J. Bryant will succeed Mr. Jack as St. Petersburg branch manager. Mr. Bryant joined the Raybro organization in March 1946 and worked in various capacities for about a year before joining the sales organization. He worked a regular territory out of the Tampa branch, and in August 1950 he was transferred to Orlando as Orlando branch sales manager. In July 1953 he was transferred back to Tampa, handling utility and R.E.A. sales out of the Tampa branch.

R. A. Conant, who has been manager of the Orlando branch for the past two years, has been promoted to sales manager of R.E.A.'s and municipalities and will make his headquarters in Tampa. Mr. Conant joined the Raybro organization in 1945 and traveled a regular territory out of the Tampa branch until February 1946, when he was transferred to the Jacksonville branch as a territory salesman. In November 1948 he was transferred to the Miami branch and specialized in utility sales, later becoming assistant branch manager in Miami. He was transferred to Orlando as branch manager in 1952.

Paul Roulstone will succeed Mr. Conant as Orlando branch manager. Mr. Roulstone joined Raybro in April 1937 and has been with the company ever since, except for a period of three and one-half years when he served in the U. S. Air Force during World War II. He returned to Raybro in December 1945 and resumed his old position as a territory salesman. In October 1949 he was transferred to the St. Petersburg branch as manager, a position he held until August 1951, when he was transferred back to Tampa as branch supply sales manager.

Also the following territorial changes have been made in the Tampa branch: **J. T. Wright,** who has been working the Lakeland-Winter Haven territory, will come back into the Tampa office in charge of counter sales. He will be succeeded in his territory by **R. Q. Coram,** who has been working the Tampa and Plant City territory. **Joe Whitehead,** who has been working in the city of Tampa, will take over Mr. Coram's territory, and **Bill Perez,** who has been on the Tampa sales counter for a number of years, will succeed Mr. Whitehead in his territory.

Dwight H. Ladd has been appointed manager of the Dallas, Texas, plant of **Federal Electric Products Co.,** and its subsidiary, Pacific Electric Manufacturing Corp.

Mr. Ladd, a graduate electrical engineer, has been active in the

D. H. Ladd

engineering field for the past 24 years. His engineering and production experience has been with Panama Canal Co., Canal Zone; Ebasco International Corp., New York; Ohio Edison Co., Akron, Ohio; and Bud Radio Co., Cleveland, Ohio.

The board of directors of **Ebasco Services, Inc.,** engineering, construction and business consulting subsidiary of Electric Bond and Share Co., have announced that **T. C. Wescott** has been appointed vice-chairman of the board. **Frederick C. Gardner,** formerly executive vice-president, was named president and chief executive officer.

Mr. Gardner has been working continuously for Ebasco or its associated companies since his graduation from North Carolina State College in 1917, when he became a draftsman on investigation of hydro-electric power sites in North Carolina. He has been executive vice-president of Ebasco since 1952.

Mr. Wescott served as president and director of Ebasco since 1945. He joined Electric Bond and Share in 1911 as resident engineer on power systems in North Carolina, Texas, Oregon and Idaho. He came to the

(*Continued on page* 66)

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Hundreds of feet of American Bonded Armored Cable are going into thousands of homes and buildings from coast to coast. Electrical contractors are specifying American Bonded because it's easy to handle, easy to install, and economical. American Bonded is the answer for those who insist on the best.

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The cable being buried in this picture is jacketed with neoprene and insulated with Anhydrex. It will get soaked every time it rains or snows. But it won't fail, as so many cables do, from water absorption. Why? Because no cable insulated with Anhydrex has ever failed from water absorption.

Anhydrex-insulated cables withstand wet weather and waterlogged ducts for long periods of time. That means exceptionally long life because of exceptionally stable electrical and physical properties possessed by Anhydrex. The specially-compounded neoprene jackets are resistant to oil, sunlight, flame, acids, and alkalies.

For these reasons, Simplex-ANHYDREX insulated cables, Type USE, are ideal for direct burial in the ground. The only protection needed is a thin bed of sand, and a board laid over the cables so that rocks and sharp instruments will not damage them. Catalog 1013 has more details. Write for it today.

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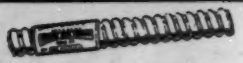
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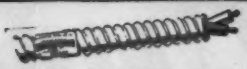
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2208 Pine Street

NEW ORLEANS
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DALLAS
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Electrical Clearing House of Louisville, Inc. W. D. Roach, Secretary-Treasurer, 731 W. Ormsby Ave., Louisville 3, Ky.

Electrical Association of New Orleans. E. H. Mowen, Secretary, 921 Union St., New Orleans, La.

Peninsula Electrical Association. J. Russell Hopkins, Secretary, c/o Central Electrical Supply Co., Salisbury, Md.

The Electric Association of Kansas City. John S. McDermott, Executive Manager, Merchandise Mart Bldg., Kansas City 8, Mo.

St. Louis Electrical Board of Trade. Carl H. Christine, Secretary-Manager, 1221 Locust St., St. Louis 3, Mo.

Electric League of Chattanooga. Paul J. McMillian, Secretary, Sixth and Market Sts., Chattanooga 2, Tenn.

Electrical League of Norfolk. Everett T. Diggs, Secretary-Treasurer, P. O. Box 605, Norfolk 1, Va.

Electrical Association of Richmond. C. F. Bennett, Executive Secretary, 205 West Grace St., Richmond 20, Va.

The Electric League of Charleston. Guilford C. Smith, Secretary-Treasurer, c/o Appalachian Electric Power Co., P. O. Box 1986, Charleston 27, W. Va.

Central West Virginia Electrical League, Inc. J. R. Waters, Secretary, P. O. Box 1392, Fairmont, W. Va.

UTILITIES

Southeastern Electric Exchange. John W. Talley, Managing Director, 303 Haas-Howell Bldg., Atlanta, Ga.

The Maryland Utilities Association. Robert L. Smith, Secretary, Frederick, Md.

Oklahoma Utilities Association. Kate A. Niblack, Secretary, Suite 2415, Oklahoma Biltmore Hotel, Oklahoma City 2, Okla.

Public Utilities Association of the Virginias. R. W. McKinnon, Executive Secretary, 5 Franklin Rd., SW, Roanoke 11, Va.

WHOLESALERS

Southeastern Electrical Wholesalers Association. M. L. Tice, Executive Vice-President, 421 Rhodes Bldg., Atlanta 3, Ga.

National Association of Electrical Distributors. Charles G. Pyle, Executive Director, 290 Madison Ave., New York 17, N. Y.

REPRESENTATIVES

Southeastern Electrical Manufacturers Representatives Club. Frank P. Bell, Secretary-Treasurer, 806 Peachtree St., NW, Atlanta 3, Ga.

Electrical Manufacturers Representatives Association, Inc. W. N. Chenoweth, Secretary, P. O. Box 75, Riderwood, Md.

Electrical Manufacturers' Representatives of Virginia, Inc. C. F. Bennett, Secretary, 205 West Grace St., Richmond 20, Va.

CONTRACTORS

Florida Association of Electrical Contractors. L. L. Dick, State Manager, 620 Stovall Professional Bldg., Tampa 2, Fla.

Association of Independent Electrical Contractors. R. E. Neumann, Secretary, 704 Frenchmen St., New Orleans 16, La.

National Electrical Contractors Association. Clint J. Harder, Secretary-Treasurer, 1200 18th St., NW, Washington 6, D. C.

NECA, Birmingham Chapter. Ernest W. Weir, Manager, P. O. Box 1781, Birmingham, Ala.

NECA, Gulf Coast Chapter. Ernest E. Smith, Manager, 402 St. Micheal St., Box 1003, Mobile, Ala.

NECA, Central Alabama Chapter. C. A. Dart, Manager, 212 Hunter Lane, Montgomery, Ala.

NECA, Arkansas Chapter. Earl G. Fisk, Manager, 904 Center St., Little Rock, Ark.

NECA, Washington, D. C. Chapter. Harry W. Kellams, Manager, 910 17th St., NW, Washington 6, D. C.

NECA, Atlanta Chapter. George L. Peterson, Manager, 709-711 Peters Bldg., Atlanta, Ga.

NECA, Southeastern Industrial Chapter. K. D. White, 946 W. Peachtree St., NW, Atlanta, Ga.

NECA, South Georgia Chapter. R. A. Kobs, Manager, 3208 Hamilton Rd., Columbus, Ga.

NECA, North Florida Chapter. W. S. Binckley, Manager, P. O. Box 3172, Jacksonville, Fla.

NECA, South Florida Chapter. Charles J. Powers, Manager, 2607 Flagler St., Miami 36, Fla.

NECA, Kansas Chapter. Charles W. Paige, Manager, 416 Central Bldg., Topeka, Kan.

NECA, Central Kentucky Chapter. Clair W. Stille, Manager, 137 Bassett Ave., Lexington 27, Ky.

NECA, Louisville Chapter. J. C. Snyder, Manager, 120 East Brandies St., Louisville 8, Ky.

NECA, Louisiana Chapter. George A. Seaman, Acting Manager, 1642 Convention St., Baton Rouge, La.

NECA, South Louisiana Chapter. Rudolph Viener, Jr., Manager, 831 St. Peter St., New Orleans 16, La.

NECA, North Louisiana Chapter. F. J. Evans, Manager, 753 Dalzell St., P. O. Box 1210, Shreveport, La.

NECA, Maryland Chapter. Robert L. Higgins, Manager, American National Bldg., Room 305, 204 North Liberty St., Baltimore 1, Md.

NECA, North Mississippi Chapter. Woodrow C. Bryan, Manager, 4634 Cedarhurst Drive, Jackson, Miss.

NECA, Greater Kansas City Chapter. J. A. Scheffer, Manager, 2201 Grand Ave., Kansas City 8, Mo.

NECA, St. Louis Chapter. R. E. Vierheller, Manager, 611 Olive St., St. Louis 1, Mo.

NECA, Carolinas Chapter. D. L. Casey, Manager, P. O. Box 4056, Charlotte 4, N. C.

NECA, Western Oklahoma Chapter. Tom M. Rushing, Manager, 704½ North Broadway, Oklahoma City 2, Okla.

NECA, East Oklahoma Chapter. Horace Y. Strader, Manager, 111 South Norfolk St., Tulsa, Okla.

NECA, Chattanooga Chapter. W. C. Harris, Manager, 402 Chattanooga Bank Bldg., Chattanooga 2, Tenn.

NECA, Knoxville Chapter. W. G. Hoffman, 312 West Jackson Ave., Knoxville 24, Tenn.

NECA, Memphis Chapter. Raymond Calhoun, Manager, 215 Madison Ave., Memphis 3, Tenn.

NECA, Nashville Chapter. G. Paul Crowder, Manager, 115 16th Ave., North, Nashville, Tenn.

NECA, Panhandle Chapter. John H. Burt, Manager, P. O. Box 2283, Amarillo, Tex.

NECA, Central Texas Chapter. Tom Clawson, Manager, P. O. Box 881, Austin, Tex.

NECA, Texas Gulf Coast Chapter. Ray R. Hayes, Manager, P. O. Box 2049, Corpus Christi, Tex.

NECA, Northeast Texas Chapter. L. E. Martin, Manager, 1923 McKinney Ave., Dallas 1, Tex.

NECA, El Paso Chapter. John E. Blaine, Manager, 310 San Francisco St., El Paso, Tex.

NECA, North Texas Chapter. C. E. Wann, Manager, Westchester House, Apt. 102, 554 South Summit, Fort Worth, Tex.

NECA, Southeast Texas Chapter. Charles Scholibo, Manager, 1100 Richmond Ave., Houston 6, Tex.

NECA, East Texas Chapter. Harry L. Wren, Manager, P. O. Box 1226, Kilgore, Tex.

NECA, West Texas-New Mexico Chapter. Edward Strout, Manager, 105 College Ave., P. O. Box 121, Lubbock, Tex.

NECA, South Texas Chapter. Frank R. Stewart, Manager, 774 East Locust St., San Antonio 12, Tex.

NECA, Rio Grande Valley Chapter. R. N. Cummings, Manager, 607 West 4th St., Weslaco, Tex.

NECA, Virginia Chapter. Richard R. Smouse, Manager, 8916 Horsepen Rd., Richmond 26, Va.

NECA, West Virginia-Ohio Valley Chapter. James E. Swan, Manager, 510½ C St., South Charleston, W. Va.

INSPECTORS

IAEI, Alabama Chapter. Hugh Roberts, Secretary-Treasurer, Alabama Power Co., 600 North 18th St., Birmingham, Ala.

IAEI, Florida Chapter. R. H. Wellwood, Secretary-Treasurer, 2605 11th Ave., NW, Bradenton, Fla.

IAEI, Georgia Chapter. W. S. Smith, Jr., Secretary, 713 Broad St., Augusta, Ga.

IAEI, Kentucky Chapter. E. H. Ruappel, Secretary-Treasurer, 201 Citizens Bldg., Louisville 2, Ky.

IAEI, George Welman Chapter. J. Clifton Young, Secretary-Treasurer, 317 Baronne St., New Orleans 9, La.

IAEI, North Louisiana-East Texas Chapter. H. E. Kirby, Secretary-Treasurer, P. O. Box 1094, Shreveport 80, La.

IAEI, Mississippi Chapter. C. B. Grauer, Secretary-Treasurer, P. O. Box 1790, Jackson, Miss.

IAEI, Missouri-Kansas Chapter. Frank C. Payne, Secretary-Treasurer, Kansas City Power and Light Co., 1330 Baltimore St., Kansas City 6, Mo.

IAEI, St. Louis Chapter. Neil W. Butteiger, Secretary-Treasurer, 7427 Canton Ave., University City 14, Mo.

IAEI, North Carolina Chapter. C. S. Whitaker, Secretary-Treasurer, City Hall, Durham, N. C.

IAEI, South Carolina Chapter. N. R. Darling, Secretary-Treasurer, P. O. Box 390, Columbia, S. C.

IAEI, Tennessee Chapter. R. J. Booker, Secretary-Treasurer, 404 Center Ave., Dickson, Tenn.

IAEI, Texas Chapter. R. L. Payne, Secretary-Treasurer, 3303 Schley St., Dallas, Tex.

IAEI, Texas Gulf Coast Chapter. M. W. McRaven, Secretary-Treasurer, P. O. Box 1700, Houston 1, Tex.

IAEI, Southern Section. A. M. Miller, Secretary, 910 West 30th St., Richmond 24, Va.

IAEI, Virginia Chapter. A. M. Miller, Secretary-Treasurer, 910 West 30th St., Richmond 24, Va.

IAEI, West Virginia Chapter. H. L. Parks, Secretary-Treasurer, P. O. Box 626, Charleston, W. Va.

MOTOR REPAIR SHOPS

National Industrial Service Association, Inc. Fred B. Wipperman, Executive Secretary, 818 Olive St., St. Louis 1, Mo.

NISA, Southeastern Chapter. M. E. Assalone, Secretary, 235 NW 2nd Ave., Miami 36, Fla.

NISA, Electric Motor Service Association of the District of Columbia. John W. Lainhart, Secretary, 913 E St., NW, Washington 4, D. C.

NISA, Louisville Chapter. W. C. Krauth, Secretary, 118 S. 1st St., Louisville, Ky.

NISA, New Orleans Chapter. William Dreis, Secretary, 1517 Calliope St., New Orleans, La.

NISA, Mid-South Chapter. Murphy G. Miller, Secretary, 109 Jennings Ave., Knoxville 17, Tenn.

NISA, Southwestern Chapter. George Foshee, Secretary, 203 S. Main, Fort Worth 4, Tex.

NISA, Electric Club of West Virginia. O. E. Jenkins, Secretary, c/o Guyan Machine Co., Logan, W. Va.

(*Continued from page 62*)

New York office in 1914 in charge of investigating hydro sites in North and South Carolina. He was elected vice-president and director of Ebasco Services in 1938. He is a director of Electric Bond and Share Co.

Appointment of three executives in the **Westinghouse Electric Corporation's Lighting Division**, Cleveland, Ohio, was announced recently by **B. S. Burke**, division manager, and **E. C. Huerkamp**, sales manager.

They are **W. R. Davies**, section manager of commercial, industrial and floodlighting products; **H. C. Smith**, manager of the specialties section which includes aviation and marine lighting, ballasts and Sterilamp equipment; and **W. S. Kolb**, assistant to the Lighting Division sales manager.

Since 1950, W. R. Davies has been specialties section manager for the Lighting Division. A native of Baltimore, Md., he received his Bachelor of Science degree in electrical engineering from Cornell University in 1947 and joined Westinghouse that year as a sales engineer. He succeeds **S. F. Davies** who has been named sales manager of the company's Micarta Division with headquarters at Trafford, Pa.

Mr. Smith has been assigned to the Westinghouse Washington, D. C., office as lighting sales engineer since 1951. A native of New York City, he joined Westinghouse in 1948 through the graduate student training course following his graduation from the University of Michigan. He served as a lighting engineer in Cleveland and New York before his transfer to the Washington office.

Until his new assignment, Mr. Kolb had been group leader for commercial, industrial and floodlighting products. He joined Westinghouse in 1947 after being graduated from Carnegie Institute of Technology in Pittsburgh.

Harllee Branch, Jr., president of Georgia Power Co., Atlanta, was elected vice-president of the **Edison Electric Institute** at its 22nd annual convention in Atlantic City. He will hold office for the next year, succeeding **Harold Quinton**, who has been named president of the Institute.

Mr. Branch, who just completed a term of office as a member of the EEI board of directors, is a native of Atlanta. He holds a B. A. degree from Davidson College and a law degree from Emory University. He was elected vice-president, general manager, and a director of Georgia Power in 1949 and was named president of the company two years later.

Mr. Branch is also a director of The Southern Co., and Southern Services, Inc., and president of the Southeastern Electric Exchange.

T. E. Mahan has been appointed manager of **Graybar Electric Company's** branch at Louisville, Ky., succeeding **C. H. Brown**, Louisville manager since 1939. Mr. Brown has retired. Mr. Mahan has been manager of Graybar's Columbus, Ohio, branch since November 1952 and has been with Graybar since 1923.

M. P. Johns, who has been manager of inside construction sales at St. Louis, and has had 15 years of service with Graybar, has taken over the management of the company's Columbus branch. Mr. Johns has been active in the Illuminating Engineering Society and the St. Louis Board of Trade.

John C. Kerin, who has been service manager for the Oklahoma City Division of the **Oklahoma Gas & Electric Co.**, since 1945, has been promoted to assistant division manager, a newly-created position. **Bill Counts**, formerly assistant service manager, has been made service manager, replacing Mr. Kerin. Mr. Kerin has been a member of Oklahoma Gas & Electric since 1927. Mr. Counts joined the company in 1936.

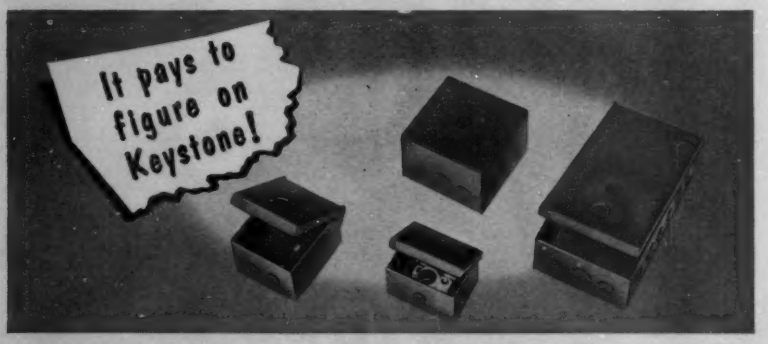
Wallace R. Wirths has joined the Public Relations Department of **Sylvania Electric Products, Inc.**, at the company's executive offices in New York, according to announcement by **George W. Griffin, Jr.**, director of public relations.

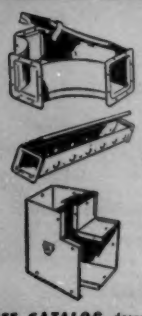
Before joining the Sylvania organization, Mr. Wirths served the Aluminum Company of America since 1943 at its Edgewater, N. J., works. For the past four years he was public relations representative of the Edgewater plant, and in 1952 was named public relations manager.

In his new post, Mr. Wirths will be responsible for public relations projects concerning several of Sylvania's operating Divisions.

The assignment of four sales representatives to district offices of **Allis-Chalmers** general machinery division in the Southern area of the nation has been announced by C. W. Schweers, vice-president and director of sales.

The men and their new posts are as follows: **Robert H. Pritchard, Jr.**, Atlanta; **Joseph D. Vincent**, Memphis; **Warren F. Spanutius**, San Antonio, and **James R. Mills**, Beaumont. All entered Allis-Chalmers employ in 1952 and recently completed the company's training course for graduate engineers.





MEET SPECIAL WIRING REQUIREMENTS WITH KEYSTONE STANDARD EQUIPMENT!

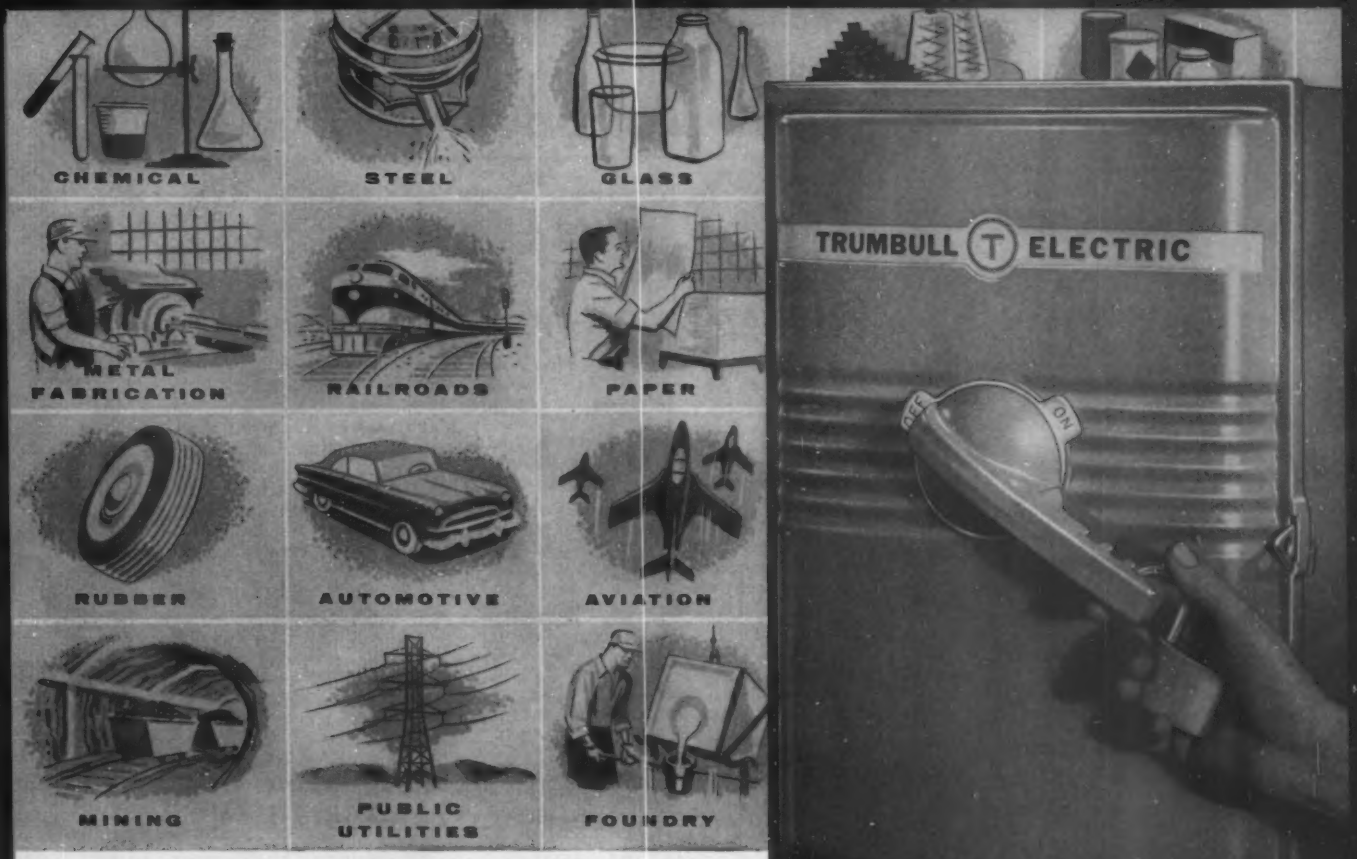
Whether it's a big wiring job or a small one, you can depend on quality, delivery, and service when you specify Keystone Wiring Installation Equipment. And you can select *exactly* what you need, too, from the complete Keystone line.

Cutout and Pull Boxes, for example, are available in both Type "A" Hinged Cover and Type "SC" Screw Cover. Both types feature a formed construction strongly fabricated and securely welded . . . with adequate, easily removable knockouts. And both types are available in a complete range of stock sizes to meet your specific requirements.

FREE CATALOG describes and illustrates the entire line of Keystone Wireways and Fittings, Cutout Boxes, Pull Boxes, Outlet Boxes, Switch Boxes, Covers, and Bar Hangers. Contains complete specifications and prices. Send for your free copy today!

KEYSTONE MANUFACTURING COMPANY
23328 SHERWOOD AVENUE
CENTER LINE (Detroit), MICHIGAN

Sold Through Leading Electrical Distributors Coast-to-Coast



PROVED ON THE JOB!

Trumbull's New Approach to Switch Design

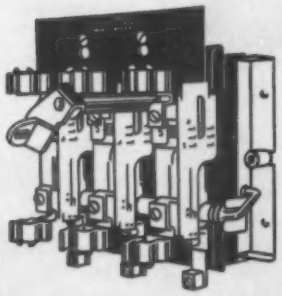
Style HCI incorporates basic improvements in safety switch design. Built to take *more* electrical punishment than your present loads will give it. Rugged enough to be as good as new years from now when its full capacity is needed. Successfully tested for use with current limiting fuses.

Revolutionary five years ago — today, proved on the job, coast to coast. Style HCI is the soundest investment you can make in switch safety, dependability and long range economy. For literature write General Electric Co., Trumbull Components Dept., 49-64 Woodford Ave., Plainville, Conn.

Front Operated for compactness. Both handle and cover can be locked, on or off, with a single padlock. If desired up to four padlocks can be used.

G-E Pole Units of exclusive circuit breaker arc quenching and heat dissipating design. Visible contacts. Quick make-quick break — will withstand heavy shorts.

Line Shield as standard feature — no exposed live parts when switch is OFF. Quickly removable interiors and ample wiring space for easy installation and maintenance.



Semi Dust Tight Enclosure (NEMA 1-A) at no extra cost. Bonderite* treated for increased corrosion resistance. New 70% lighter Water-Tight and Dust-Tight lead plated enclosures available (NEMA 4 & 5). AMPERE RATINGS 30-60-100 & 200 fusible and no fuse.

HCI Disconnect Switches provide advantages for a wide range of product applications of the Original Equipment Manufacturer. Ideal for use in switchboard, panelboard and industrial control applications.

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* T. M. REG. PARKER RUST-PROOF CO.

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SERVICE ENTRANCE PYLETS

HEADS
CAPS
ELBOWS
CONNECTORS

Entrance Heads

FORMERLY MANUFACTURED BY THE M. B. AUSTIN COMPANY

Another important addition to an extensive and continuously expanding line of high quality, heavy duty wiring and lighting products.

PYLE-NATIONAL'S COMPLETE LINE INCLUDES:

Cable Clamp Caps

Entrance Caps

Entrance Elbows

- Pylet conduit fittings for hazardous and non-hazardous locations.
- Safety switches.
- Circuit breakers.
- Plugs and receptacles, Triploc, Midget Triploc, Quelarc and Strate-Line.
- Push-button and pilot light Pylets.
- Lighting fixtures, explosion-proof, dust-tight, vapor-tight.
- Junction Pylets.
- Cord and cable sealing grips—conduit unions.
- Floodlights and pit lights.
- Loading lights.
- Gyralite visual warning signals.

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Refer to Bulletin No. 1135 . . . or call your Pyle-National Electrical distributor.

THE PYLE-NATIONAL CO.
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Technical books

for the electrical man

Linear Transient Analysis

By Ernst Weber, John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 348 pages, $7.50.

In this encyclopedic work the reader will find an equal treatment of all methods of transient analysis. The author emphasizes the wide variety of approaches from which the engineer may choose in actual application. Thus the book presents an extensive and critical review of classical and operational methods of analysis before entering upon the Laplace transform and Fourier integral methods. The fundamental exposition of each method is accompanied by many illustrations of the applications to practical circuit problems.

The first chapter examines the circuit concept and its relation to the electromagnetic field phenomena in terms of the underlying physical concepts and relations. The second chapter reviews the classical formulations of transients in linear networks by means of integro-differential equations. Considerable stress is laid upon the discontinuous nature of many conventional source functions and the need for careful procedure in mathematical treatment. The classical treatment is carried through to the various superposition theorems so that the solution for any type of source function can be found readily.

Because of the increasing importance of the circuit concept in mechanical and thermal systems, Chapter 3 treats analogs from a fundamental point of view, with many illustrative examples. Chapter 4 presents Heaviside's operational method with the modification given it by H. Jeffreys which permits a rigorous, systematic, and self-consistent development.

The Laplace transform concept is introduced in Chapter 5. Extensive tables of transform pairs are included in a form which facilitates effective use in the solution of the great majority of practical problems.

The final chapter establishes the frequency spectrum concept and illustrates the transition from the discrete spectra of periodic functions to continuous spectra of nonperiodic functions, parelleling the transition from Fourier series to Fourier integrals.

The needed mathematical background for various sections is reviewed in appendices, which also include notes on the symbols used and a short bibliography of relevant books.

The author, Dr. Weber, is head of the Department of Electrical Engineering and director of the Microwave Research Institute of the Polytechnic Institute of Brooklyn. He is a fellow of the American Institute of Electrical Engineers, the American Physical Society, and the Institute of Radio Engineers. He is also a member of the American Mathematical Society and the American Society for Engineering Education.

The author of several other technical books, Dr. Weber has also had published some forty scientific papers and papers on engineering education.

Selling Electric Service 1879-1954

By William E. Clement, sponsored by the Electrical Association of New Orleans, 921 Union St., New Orleans, La., 72 pages, $1.00.

Electric service and the use of electricity in homes, factories and stories did not just come about. It had to be "sold" to the American public. The story of this remarkable accomplishment has remained untold until now.

William E. Clement, an old-timer in the electrical business, has written this book in such a manner to give a picture of the early struggle of the power companies to bring electric service to the public and to overcome the resistance to its use for illumination, home comfort appliances, and as a source of power.

He was an early participant in the selling of electricity and narrates many of his experiences. The new generation can learn something here about how ideas were employed to create sales. Salesmen and sales managers will find this book interesting and inspiring.

The book contains 40 illustrations — many of them quaint advertisements of 50 years ago.

Lighting Handbook

Advertising and Sales Promotion Dept., Westinghouse Lamp Division, Bloomfield, N. J., 250 pages, $2.50.

A new and revised edition of the Westinghouse Lighting Handbook —Light's Diamond Jubilee Issue—

TROFFERS

Years ahead in design....

PARGLO* LOUVERS

ANOTHER *Eastern* EXCLUSIVE

TO GIVE RECESSED LIGHTING

- UNBELIEVABLE NEW BEAUTY
- DISTINCTIVE DESIGN
- TRUE LIGHTING EFFICIENCY

SEND FOR COMPLETE CATALOG

EASTERN FIXTURE CO.

170 VERNON STREET, BOSTON 20, MASSACHUSETTS

is now available. This complete pocket-size manual offers a comprehensive coverage of the general field of modern lighting practices.

Included in the 250 pages are a fold-out page in full color of the electro-magnetic spectrum; information on distribution curves and light measurement; an up-to-date section on light sources; latest information on coefficients of utilization and maintenance factors, together with complete footcandle tables; and many application illustrations useful in dealing with modern lighting problems.

The complete coverage of lighting topics provides a compact handbook indispensable to every lighting engineer, designer, electrical contractor, and architect who deals with lighting.

Chapters include: The Eye and Vision; Light Characteristics and Measurements; Light Sources; Introduction to Lighting Design; Illumination Levels; Interior Lighting Design; Interior Wiring for Lighting; School and Office Lighting; Store Lighting; Industrial Lighting; Architectural Lighting; Floodlighting Design; Street Lighting; Sign Lighting; Germicidal Lamps and Sun Lamps; and The Cost of Lighting.

(*Continued on page* 88)

Free bulletins

available to our readers

The **Furnas Electric Company**, 1064 McKee St., Batavia, Illinois, has announced the publication of a new 140-page **electric motor control catalog.** Primarily divided by major classifications, this catalog, No. 101, contains engineering and design data including wiring diagrams. Among the more than 2,700 items listed are magnetic starters and contactors, combination starters, control panels, drum controllers, master, foot and pressure switches.

For your free copy, circle number B901 *on the handy coupon on page* 76.

A new four-page colored bulletin outlining the latest improvements and most recent data on **Tilden Rotary Konkrete Kore Drills** has been made available to dealers and users by the **Tilden Tool Manufacturing Co.**, 209 Los Molinos Ave., San Clemente, Calif.

Tilden has a complete line of masonry drills and accessories — tungsten carbide rotary and hammer bits, water feed drills, Morse tapers, drilling jacks and special rock and tile drills. Tilden's free sharpening service is continued and free leatherette and plastic carrying kits are available to all drill purchasers. The folder also outlines complete specifications, gives prices and recommends speeds and pressures and sizes for various types of use.

For your free copy, circle number B902 *on the handy coupon on page* 76.

A new **"Fluorescent Guide,"** written in non-technical language for the use of both buyers and sellers of fluorescent products, has been announced by **Sylvania Electric Products, Inc.**, 1740 Broadway, New York 19, N. Y.

The new guide was prepared solely as an informative reference digest to assist the buyer to purchase more intelligently and the salesman to sell more effectively. It contains information on what fluorescent lighting is, its advantages, the sizes in which lamps are available, colors, necessary accessories, and many other pertinent facts.

For your free copy, circle number B903 *on the handy coupon on page* 76.

These Revere Floods are Ideal for MERCURY VAPOR INSTALLATIONS!
ELECTRIC MFG. CO. CHICAGO
AVAILABLE IN OPEN AND ENCLOSED TYPES
Permits Balancing Mercury and Incandescent in same type unit
★ Light weight Alzak Aluminum.
★ Low wind resistance.
★ Double Parabola reflector design gives positive control of light with high reflective efficiency.
★ Smallest size floods capable of taking 1000 watt lamps.
★ One-Piece housing—completely protects wiring, socket, lamp and prevents entrance of moisture.
★ Clean-cut appearance—floods blend with architecture.
★ Available in 2-open types and two lens types for wall, wood pole, cross arm, clamp or slip mountings.
★ All parts corrosion resistant.
Revere No. 3350 Series
If you have a mercury vapor job coming up do not fail to investigate this outstanding Series of Revere Floods. Write us.
REVERE ELECTRIC MFG. CO. 6005 BROADWAY CHICAGO 40, ILL.
INDOOR & OUTDOOR LIGHTING FOR EVERY NEED
WHATEVER THE NEED
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MAKES THE FLOODS
750—1000—1500 WATT ENCLOSED FLOODS
300 to 1500 WATT ELIPTOR FLOODS
18 and 20 in REAR SERVICE FLOODS
"ENDOVAL" MERCURY VAPOR LUMINAIRE
AREA LIGHTERS WITH TOP FLOODS

Technical Bulletin 386-F, which describes in detail the GPT arm bracket, as well as the construction and illumination characteristics of fixtures MDB-14 and MDB-10, has been announced by **Crouse-Hinds Co.**, Wolf and 7th North Sts., Syracuse, N. Y.

For your free copy, circle number B904 *on the handy coupon on page* 76.

A colorful catalog on their new line of **recessed lighting fixtures** for homes and commercial installations has recently been released and is available without cost from **Markel Electric Products, Inc.**, 145 Seneca St., Buffalo 3, N. Y.

For your free copy, circle number B905 *on the handy coupon on page* 76.

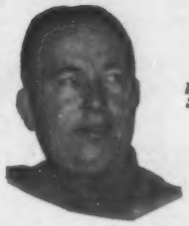
Nepo Manufacturing Co., 6025 N. Keystone Ave., Chicago 30, Ill., maker of mercury vapor lighting equipment, poles and mast arms, has announced a new **50-page catalog** describing in detail the complete Nepo line.

For your free copy, circle number B906 *on the handy coupon on page* 76.

An attractive catalog, completely illustrated, and containing details and price information on their new line of **all aluminum posts and cast aluminum lanterns** is available from

CONNECTICUT BUILDERS COMPLETE 225 HOMES— REPORT . . .

"Unqualified Satisfaction" WITH FASCO VENTILATING FANS

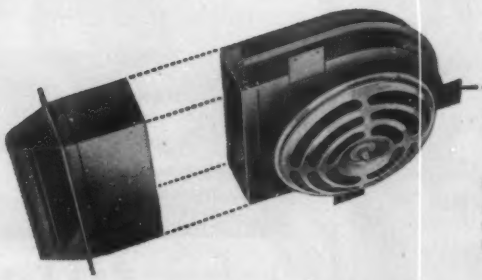


C. W. GOEBEL,
Vice-President
Hearthstone Park, Inc.
Stamford, Connecticut

LEONARD W. LEEDS,
President
Hearthstone Park, Inc.
Stamford, Connecticut

"You will be pleased to know that throughout our operations we have used your Fasco Ventilating Fans with unqualified satisfaction. The true test is not in builders' selection at the outset, but the maintenance-free and ease of operation utility which provides our buyers with a kitchen exhaust fan that does a good job."

LEONARD W. LEEDS



Typical of the kitchens as displayed in the model home of Hearthstone Park, Inc.

Model 1021-for inside walls and ceilings

This FASCO Kitchen Ventilating fan is adaptable for a wide range of installations—inside wall above stove—thru cabinets—in ceiling. Housing 3¼" thick. Engineered for most difficult type of exhausting—by pressure, thru ducts. New FASCO Turbo-Radial Impeller develops pressures unobtainable by ordinary fan blades. 10" Impeller, 530 C.F.M.

These noted builders realize that Fasco Ventilating Fans provide convenience in living . . . convenience that every prospective home owner wants. Do as these and hundreds of builders throughout the nation do—specify Fasco for every Ventilating Fan installation. For complete information write Fasco today.

MANUFACTURERS OF THE ONE COMPLETE LINE OF VENTILATING FANS

FASCO INDUSTRIES, INC.

39 AUGUSTA STREET
ROCHESTER 2,
NEW YORK

Hadco Aluminum Products, 501 Pressley St., Pittsburgh 12, Pa. The new Hadco line consists of 12 post selections and seven attractive lantern models.

For your free copy, circle number B907 *on the handy coupon on page* 76.

Miller Equipment Co., Inc., Franklin, Pa., has anounced the release of its new catalog, No. 54A, which contains descriptive material on the company's line of **safety equipment and materials.** The Miller products include safety belts, pliers, tool carriers, and safety boots and other wearing equipment.

For your free copy, circle number B908 *on the handy coupon on page* 76.

New four-inch square bracket boxes, furnished with clamps for armored cable or clamps for nonmetallic sheathed cable, are described in a new bulletin offered by **Keystone Manufacturing Co.,** 23328 Sherwood Ave., Center Line, Mich. Keystone is also offering a **new catalog** describing and illustrating their entire line of wiring installation equipment. The catalog is complete with schematic installation diagrams and specification sheets.

For your free copy, circle number B909 *on the handy coupon on page* 76.

New products

(For more information, use coupon on page 76)

Outlet junction boxes increase job efficiency

A NEW SERIES of multiple electrical outlet junction boxes is now being marketed by National Wire and Cable Corp., 136 San Fernando Rd., Los Angeles, Calif. They provide sufficent outlets right beside the job for lights and power equipment.

This new product is ideal for machine shops, garages, repair shops, cabinet shops, factories, or whatever power equipment and lights are needed for production.

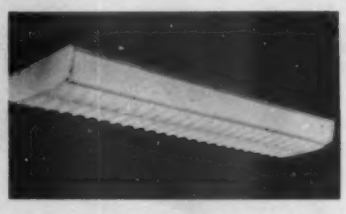
All junction boxes employ heavy duty plugs and can be obtained in seven different combinations. Model No. 5001 has four two-wire "T" slot outlets; No. 5002, two two-wire "T" slot and two three-wire straight type outlets; No. 5003, four three-wire straight type outlets; No. 5004, two two-wire "T" slot and two three-wire twist lock outlets; No. 5005, four three-wire twist lock outlets; and No. 5006, two two-wire "T" slot and two two-wire twist lock outlets. Cord on these six models is heavy duty type "S". Model No. 5000 has four two-wire "T" slot outlets with regular cord.

The boxes, wire, and outlets of the new four-way heavy duty junction boxes are of heavy duty materials and precision made. The cord comes in 15, 25, 50, and 100 foot lengths. A strain-relief anchor keeps the wire from pulling out.

For additional data, circle item 910 *on the handy coupon on page* 76.

New luminaire series has long, low lines

A NEW SERIES of two-lamp, four- and eight-foot fluorescent luminaires called "The Garfield" has been added to its Presidential Line by Pittsburgh Reflector Co., 405 Oliver Bldg., Pittsburgh 22, Pa. Designed primarily for ceiling mounting, the unit has



an overall depth of only 3⅞ inches, with a width of 12½ inches for the two-lamp unit. These long, low lines make "The Garfield" particularly well adapted for use where low ceilings necessitate a shallow illuminating source. When ceiling mounted the unit has a "built-in" appearance achieved by the wide panels which appear to blend into the ceiling.

It is built around a rigidly constructed chassis. Side panels of diffusing polystyrene and a bottom louver with 35 degree by 35 degree shielding combine to give the unit a comfortable brightness pattern. A permanently attached top-closure type reflector assures high efficiency and ease of maintenance.

While "The Garfield" is designed primarily for ceiling mounting, it

Through Research, Tomic adds something NEW!

TOMIC SALES & ENGINEERING CO.
20000 Sherwood Ave. Detroit 34, Michigan

B-M *Fittings*

ARE APPROVED AS CONCRETETIGHT

When setting E. M. T. in concrete you can make each job easier and more profitable by using Briegel All Steel Indenter Fittings that have UL approval as CONCRETE-TIGHT. Contractors the world over recognize their cost cutting qualities and the fact that they make each wiring job a better job. It is only natural that Briegel Fittings are the most widely used E. M. T. connectors and couplings.

Cross Section Showing Indentations.

All B-M Indenter Fittings are U. L. approved as Concrete-tight and for General Use. (File Card E 10863). Also comply with Federal Specifications W-F-406.

BRIEGEL METHOD TOOL CO.

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Warehouse Stocks in Principal Cities for Immediate Delivery!

ready-wired
continuous
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office buildings,
factories, stores,
institutions

PLUGMOLD
builds better
business for you
... at a profit!

GET A 20-FOOT PLUGMOLD PACKAGE today! One job will convince you that this is the most satisfactory and profitable way to install convenience outlets! Provides outlets every 30", 18", 6" or closer in clusters. Write for full information.

PLUGMOLD

fastest, easiest, cheapest way
to more electrical outlets

Rely on Wiremold's "Big 4" to solve your wiring problems! Plugmold Continuous-Outlet Systems — Wiremold Surface Raceways — Pancake Overfloor Raceways—Wiremold Fluorescent Units.

The WIREMOLD Company
HARTFORD 10, CONN.

Wiremold products are backed by a firm guarantee. See page 7 of Wiremold Catalog No. 19.

may be suspended from hangers when a pendant mounted direct luminaire is required. Whether surface or pendant installed, both the four- and eight-foot Garfield may be individually mounted or mounted end-to-end to form a continuous row. The units are wired completely, ready-to-install and are available either with 96-inch slimline or 40-watt bi-pin lamps. They are finished in a baked-on white enamel. Underwriters' Laboratories, Inc. listed. Write the company for full information and specifications.

For additional data, circle item 911 on the handy coupon on page 76.

Westinghouse capacitors for secondary networks

COMPLETELY ASSEMBLED capacitor equipments ready for installation on secondary network systems are available from the Westinghouse Electric Corp., Pittsburgh, Pa. The apparatus is especially applicable for use on

urban distribution systems where there is air-conditioning and other low power factor equipment.

The capacitor units are Westinghouse standard outdoor type, rated at 13 1/3 kvar at 216 volts. Assembled equipments are available for 40, 80, and 120 kvar, three phase. Modular-type construction permits them to be stacked three high, or otherwise arranged to fit available vault space.

The equipment is completely submersible. Enclosed current-limiting fuses are terminal mounted. The capacitor units are zinc sprayed, and the frame is galvanized.

For additional data, circle item 912 on the handy coupon on page 76.

Heating regulator ideal for small home

CONSTANT COMFORT, by changing indoor temperatures as outdoor temperatures change, and the steady, smooth flow of heat that equalizes warmth from floor to ceiling are features of the new Three-Way Weather-Flo "small home" heating regulator announced by Automatic Devices Co., Western Springs, Ill.

Both outdoor and house temperatures are measured and the burner is operated just enough so that the temperature of the air or water circulated is raised only high enough to offset the resultant heat loss. It works equally well on gravity or forced flow, on warm air or hot water heating systems. It requires only about one hour to install on an exist-

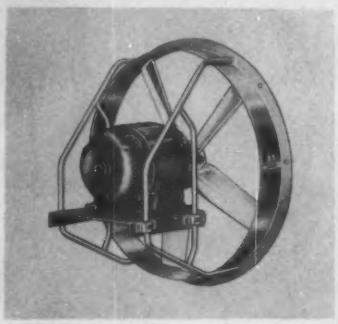
ing burner or on a new building, and saves up to 15 per cent on fuel.

"Hot-cold, hot-cold" heating, a characteristic of ordinary room thermostat control so objectionable on gas or oil fired systems, is replaced by a smooth flow of heat that puts an end to chilly floors and "hard-to-heat" rooms. Such disadvantages of "hot-shot" heating as piping or duct noises, draftiness, excessive dryness, and dirt accumulation on walls and drapes are also eliminated. Descriptive literature is available from the company.

For additional data, circle item 913 on the handy coupon on page 76.

Direct driven fan for industrial application

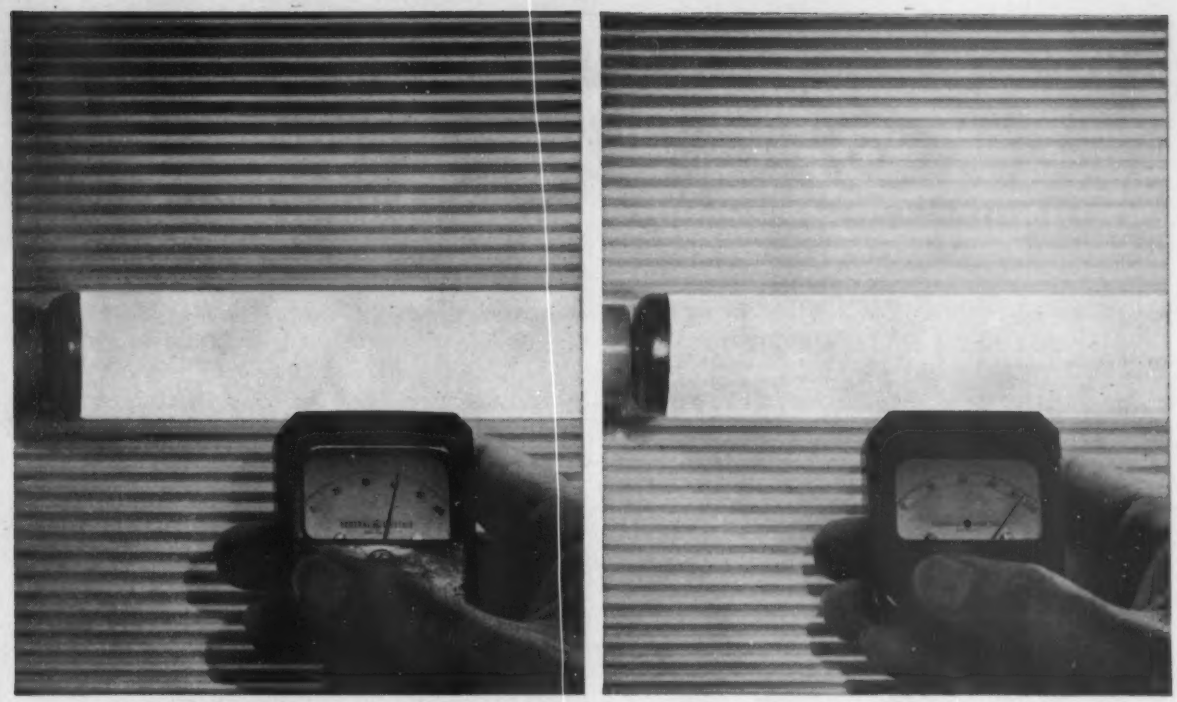
A HEAVY DUTY direct driven fan for industrial application and service industries where a large volume of air is required under static pressure has been developed and added to the complete line of fans manufactured by the M & E Manufacturing Co.,



2533 Winthrop Ave., Indianapolis 5, Ind.

Where positive low cost ventilation exhaust is needed to remove fumes, vapors, smoke, and dust, the "axial flow" principle of the design of the M & E heavy cast aluminum alloy blade shows its high operating efficiency.

The ring mounted units are avail-



Regular slimline, left, gives 620 units of light. New High Output Rapid Start lamp, right, gives 840 units of light.

NEW GENERAL ELECTRIC FLUORESCENT LAMP GIVES ⅓ MORE LIGHT THAN ANY PREVIOUS FLUORESCENT

LIGHTS ALMOST INSTANTLY—General Electric announces the most important advance in fluorescent lighting in 10 years: the new High Output Rapid Start fluorescent lamp. The 96-inch High Output lamp gives 36% more light than the most powerful G-E fluorescent lamp previously available.

For new installations, General Electric High Output lamps offer this ⅓ bonus of light without increasing the number of fixtures or maintenance costs.

This big increase in light, with no increase in lamp size, has been achieved through a special cathode developed by General Electric which permits a boost in lamp wattage to 100. Because the cathode is of the famous General Electric triple coil design, these Rapid Start lamps light up almost instantly. General Electric High Output lamps have a rated life of 7,500 hours, the same as all General Electric general lighting fluorescent lamps.

A new G-E base and socket design protects the lamp contacts by recessing them. A simple push-pull sets the lamp in its fixtures.

HAS VARIETY OF USES

The new General Electric High Output fluorescent lamp is especially suited for use in areas with high ceilings, in factories, warehouses, offices and stores. Also in store windows, showcases and other places where you want higher lighting levels in keeping with the modern trend. New fixtures designed for the G-E High Output lamp will soon be available from a number of lighting fixture manufacturers.

For information, write to Lamp Division, General Electric Company, Dept. 166-ES-9, Nela Park, Cleveland 12, Ohio.

Progress Is Our Most Important Product

GENERAL ELECTRIC

ELECTRICAL SOUTH
806 Peachtree St., N.E.
Atlanta 5, Ga.

September, 1954

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B902	B908	914	920	926	932
B903	B909	915	921	927	933
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B905	911	917	923	929	
B906	912	918	924	930	

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FOR MORE INFORMATION — Use this handy return coupon for requesting manufacturers bulletins or additional information on new products listed in these pages. Be sure to give firm name and your position or title.

able in diameter sizes from 12 inches, delivering 980 cfm, to 48 inches, delivering 32,400 cfm. Totally enclosed motors are furnished with the fans providing the user with a minimum amount of installation labor.

Performance specifications and descriptive data are available on request from the company.

For additional data, circle item 914 on the handy coupon on this page.

Blo-Fan makes a lot of satisfied customers

Install Blo-Fan and forget it
No service problems to plague you
Choice of 4 sizes
For ceiling, wall, soffit or cabinet installation
Power packed patented blade
No other blade moves so much air, so quietly
Exclusive 9-position control switch
More profit for you than 15 regular outlets

Specify the line designed by

pryne

rhymes with FINE...and means it!

AEROFAN

Exhaust fans for multiple housing projects and remodel work

PRY-LITES

Residential and commercial recessed lighting fixtures

GLOMASTER

Infra-red, recessed, auxiliary wall heater

BOX S-94, POMONA, CALIFORNIA
Eastern Factory: Keyser, West Virginia
Warehouses: Los Angeles; San Francisco; Chicago; Newark, New Jersey
Distributed by Electrical Wholesalers Everywhere in the U. S. and Canada

New electric heater for hard surface walls

A NEW MODEL electric heater which can be easily mounted on concrete, brick or stone walls, has been designed by Electromode Corp., Rochester 3, N. Y. Known as the Electromode Surface Mounted Wall Heater, it was developed in answer to the demand for such a model to

use in basement game room, laundry, garage, office, or any room with hard surface walls.

The new model has the same quality and safety features as the well-known Electromode Down-Flo Wall Heaters which are built into the wall. Clean, fan-forced heat is circulated at floor level and the patented, cast-aluminum, sealed-in heating element eliminates any danger of fire, shock or burn. Its silver gray hammertone finish blends with almost any surroundings. It is available in 1,500, 2,000, 3,000 and 4,000 watt capacities, in both automatic and non-automatic models.

To make surface mounting easy,

would your customer turn down a savings of $4,000 on a $40,000 lighting expenditure?

Your customers can enjoy the benefits of the *finest* lighting money can buy and effect really substantial savings at the same time, simply by buying the *right* lighting fixture. Time and again, the better design and efficiency of Smithcraft Fluorescent Fixtures result in *fewer units* to produce recommended lighting levels.

Here's an actual case history of how a Pennsylvania department store saved 10% in initial costs and 10% in operating costs . . . or approximately $4000 on a ten-year $40,000 expenditure.

Before re-lighting, a complete survey was made and exact lighting requirements were established. To meet these requirements, Smithcraft units and units of several nationally-known top quality manufacturers were subjected to an exhaustive *comparative* analysis. Here are the results:

10% FEWER UNITS REQUIRED

Number of units required to achieve recommended lighting levels: ..... Smithcraft — **270**
2nd Best Fixture — 297
3rd Best Fixture — 339

10% LESS INSTALLATION COST

Proportionately less labor and materials were required to install the 270 Smithcraft units than the 297 units of the nearest competitor.

10% FEWER LAMPS

(Initial & Replacement)

Lamps required: ..... Smithcraft — **706**
2nd Best Fixture — 776
3rd Best Fixture — 914

Recommended practice is to replace lamps every 18 months—a continuing 10% savings.

10% LESS POWER CONSUMPTION

Required wattage: ..... Smithcraft: **51.3** kilowatts
2nd Best Fixture: 56.3 kilowatts
3rd Best Fixture: 64.8 kilowatts

Whether you're lighting a store, office, school, factory, or institution, it pays to *buy lighting — not fixtures.* Invest in Smithcraft — America's Finest Fluorescent Lighting Equipment.

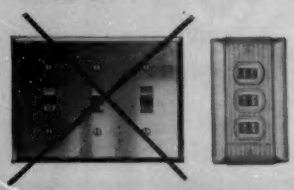
PHOTOGRAPH SHOWS AN INTERESTING PATTERN ARRANGEMENT OF THE SMITHCRAFT LOUVERLITE SLIMLINE IN THE PENNA. DEPT. STORE DESCRIBED ABOVE.

BUY LIGHTING — NOT FIXTURES. INVEST IN AMERICA'S FINEST FLUORESCENT LIGHTING by
Smithcraft
LIGHTING DIVISION
CHELSEA 50 MASSACHUSETTS

P&S® DESPARD LINE® The Original Interchangeable Line

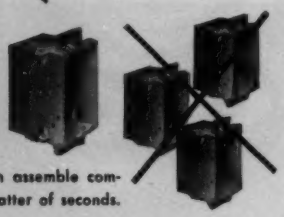
Wire THE MODERN WAY

Two or three devices in the space ordinarily required for one . . . for a neater, better-looking job.



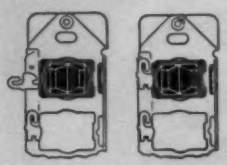
SAVE ON WALL PLATES

SAVE ON BOXES



. . . and, you can assemble combinations in a matter of seconds.

NO TOOLS NEEDED



Just insert the device and engage cam.

Here's How P&S DESPARD Builds Business For You

- **Smaller Inventories—Smaller Investments**

  With a small stock of P&S Despard devices you are prepared to assemble practically any desired combination. You can give more service, faster, with a smaller inventory—and a smaller investment. Small, compact P&S Despard devices take up little room on your shelves—weigh much less than old-fashioned devices.

- **Makes Your Job Easier—Simpler**

  No need to stock (or wait for) special factory assembled combinations and clumsy, expensive multi-gang plates—no need for large bulky boxes. You can cope with the multitude of controls needed in modern institutional and commercial buildings—provide for real electrical convenience in modern homes—and assemble these good-looking combinations right on the job quickly and easily.

- **Builds a Reputation for Quality**

  Thousands of P&S Despard installations throughout the country are proof of the dependability of these precision-built devices. T-rated switches and double grip outlets meet Federal Specifications. You can be sure of a trouble-free installation, with no come-backs.

- **Gives You Merchandise You Can Sell**

  The P&S Despard Line looks different—and is different. The smartly styled, functional combinations have eye-appeal—yet, from a practical viewpoint, provide more convenience per dollar than any other line on the market. Build your business with P&S Despard beauty, convenience and dependability.

Use the coupon to get your copy of P&S Catalog 49.

Pass & Seymour, Inc., Dept. ES
Syracuse 9, N. Y.

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We buy from_____

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1229 W. Washington Blvd., Chicago 7, Ill.

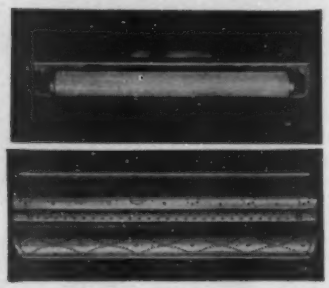
Manufacturers of Switches, Outlets, Surfex, Turnlok, Polarized, Weatherproof Devices, Lampholders, Uniline Wall Plates.

three "T" slots are provided on the back of the heater. Provision is also made for service connections. The heater is 21 inches high, 17 inches wide, and extends 5½ inches from the wall.

For additional data, circle item 915 on the handy coupon on page 76.

New all-chrome brackets have adjustable reflector

TWO ULTRA-MODERN designer lines of fluorescent brackets, competitively priced for maximum consumer appeal, have been introduced by Markstone Manufacturing Co., 2460 W. George St., Chicago 18, Ill. Featuring an all-chrome bracket with adjust-



able, perforated reflector, both lines are ideally suited to dozens of home and commercial lighting needs.

"Bellaire" brackets are finished in lustrous triple chrome plate or genuine gold plate, with matching reflectors. "Patrician" open-type brackets come in either triple chrome plate or polished brass finishes. Both Patrician and Bellaire brackets are also available with decorator styled glass shields trimmed in gold or silver.

In addition to contemporary slim, straight-line styling, Markstone's new series features easy installation and convenience. Markstone development, "E-Z Off" removable reflector, takes only seconds to remove for lamp replacement and cleaning, without tools. Simple finger-tip adjustment tilts reflector to desired effect.

For additional data, circle item 916 on the handy coupon on page 76.

House wiring plans afford efficient control

THE ELECTRICIAN, experienced or inexperienced, will find a wealth of usefulness in the "Typical Wiring Diagram for Residential Construction."

A set of three big blue-prints, each 18 inches x 29 inches, depicts every phase of house wiring from the service entrance equipment to the last fixture, convenience outlet, switch, and electric stove and drier.

Here is the whole job laid out for you in easy to read, easy to follow

SALES CLIMBED 150% IN '53 50% MORE IN '54!

And that's not all . . . Cavalier heaters give you more dollars and more profits per man hour . . . are quickly, easily installed and carry with them the sale of wire, conduit, panels, switches and other materials which give you a bigger share of the builder's dollar.

PALMER ELECTRIC COMPANY
WHOLESALE
ELECTRICAL SUPPLIES
Seattle 9, Wash.

June 15, 1954

Cavalier Corporation
Chattanooga 2, Tenn.

Attention: Mr. Melvin H. Wessel
Electric Heater Division

Gentlemen:

Due to the ever - increasing demand for CAVALIER heaters, our sales have increased as follows

1953 over 1952 - 150%

Also, for the first half of 1954 our sales were up another 50% over the same period of 1953.

The above figures are proof of our enthusiasm for the distribution of your high quality line of electric heaters.

Yours very truly,

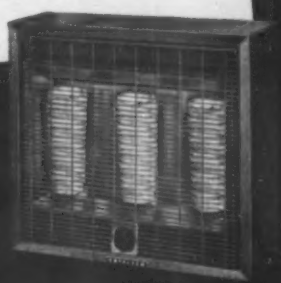
PALMER ELECTRIC CO.

By Elbert C. Palmer
Elbert C. Palmer

Cavalier ®

AUTOMATIC ELECTRIC HEATERS

Wall Insert, Surface Mounted, Portable, Full Chrome Finish Wall Insert, and Non-automatic Bathroom Heaters, and Floor Furnaces.



SURFACE MOUNTED HEATER

WRITE FOR DESCRIPTIVE LITERATURE
and Guide for Calculations of Electric Space Heating

CAVALIER CORPORATION
Electric Heater Division
CHATTANOOGA 2, TENNESSEE

form, keyed to an accompanying text that makes it easy to check off needed parts as you go and order them without trouble.

Typical floor and basement plans are also included to illustrate the easiest and most economical way to wire entire floor areas.

Use of these plans on every electrical wiring job will reduce errors, save time, avoid misunderstanding in ordering parts, and make them pay for themselves in many ways.

Each sheet of the set bears the seal of approval of a Registered Professional Engineer.

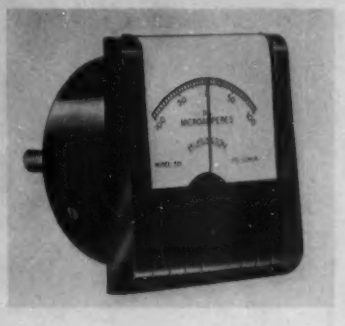
The Wiring Diagrams ($5 per complete set) are published by the Home Building Plan Service, 2454 N. E. Sandy Blvd., Portland, Oregon.

For additional data, circle item 917 on the handy coupon on page 76.

Plexiglass front affords instrument movement view

A NEW PLEXIGLASS front 2½-inch square semi-flush model instrument is the newest addition to the Burlington Instrument line. Since the entire front case is molded of Plexiglass it can be furnished absolutely clear, thus giving a view of the instrument movement, which is sometimes desired for certain scientific or medical applications.

The large square window which slopes backwards at a slight angle together with the decorative vertical ribbing on the lower part of the cover have been designed to harmonize with modern trends in industrial design. The rim and lower third of the case may be spray lacquered



in any color desired with a variety of surfaces, from glossy, through flat finishes, to dull mat finishes.

These instruments are available with both DC or AC movements, also as Rectifier type instruments, for VU and DB indicators and AC Voltmeters. Thermocouple RF Milliammeters utilizing an internal thermocouple are available in the same model.

For further particulars on this new Model 721, 2½ inch square Plexiglass front instrument write to Burlington Instrument Co., 151 North Third St., Burlington, Iowa.

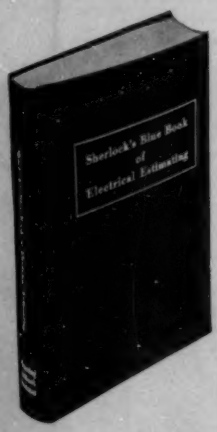
For additional data, circle item 918 on the handy coupon on page 76.

Magnetic relay has knife-edge bearing

A NEW COMPACT magnetic relay, designed for use with single phase capacitor start motors requiring a voltage-sensitive relay to disconnect the start winding or reduce the capacitance when the motor approaches full speed, has been announced by the Square D Co., 4041 N. Richards St., Milwaukee, Wis.

Assembled on a molded phenolic base, the device measures only 2-11/16" high, 1-15/16" wide, and 2-½" deep. The clapper-type magnet is designed with a permanent air gap, a knife-edge bearing, ground sealing surfaces and a heavy shading coil, to provide long life and quiet operation. It is fully described in Bulletin Class 8505 Type C.

Double break, silver-to-silver contacts on the single pole, normally-closed relay are capable of handling



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ESTIMATING GUIDE

Covers Over 2000 Wiring Jobs
This new, entirely different estimating guide has 175 completely worked out charts.

Authentic, Time Saving—Easy to Use
This book is easy to use—it has no complicated mathematics or formulas to work over. You merely determine the nature of the wiring, check it in the BLUE BOOK OF ELECTRICAL ESTIMATING and there's your answer—it's the simplest estimating book ever written.

See It 5 Days Free
This book was written by a successful electrical contractor and estimating engineer with over 20 years' experience. It has an entirely different method of determining estimates on wiring jobs. Electrical contractors, journeymen, architects, and engineers will find use for this book every day. Gives time required to do jobs along with complete labor charges in every state in the country. Order this book now from your supplier at special introductory price of $7.75, or send coupon below.

Dealer inquiries invited.

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Send me the NEW BLUE BOOK OF ELECTRICAL ESTIMATING for 5 days free trial. I understand I may return the book within 5 days and owe nothing. If I keep it I will pay $7.75 plus postage for shipping.

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Wire Pulling Lubricant

Only Y-ER EAS has all these features

- Creamy, non-corrosive lubricant. Never greasy or messy.
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GIVES THE SLIP TO—
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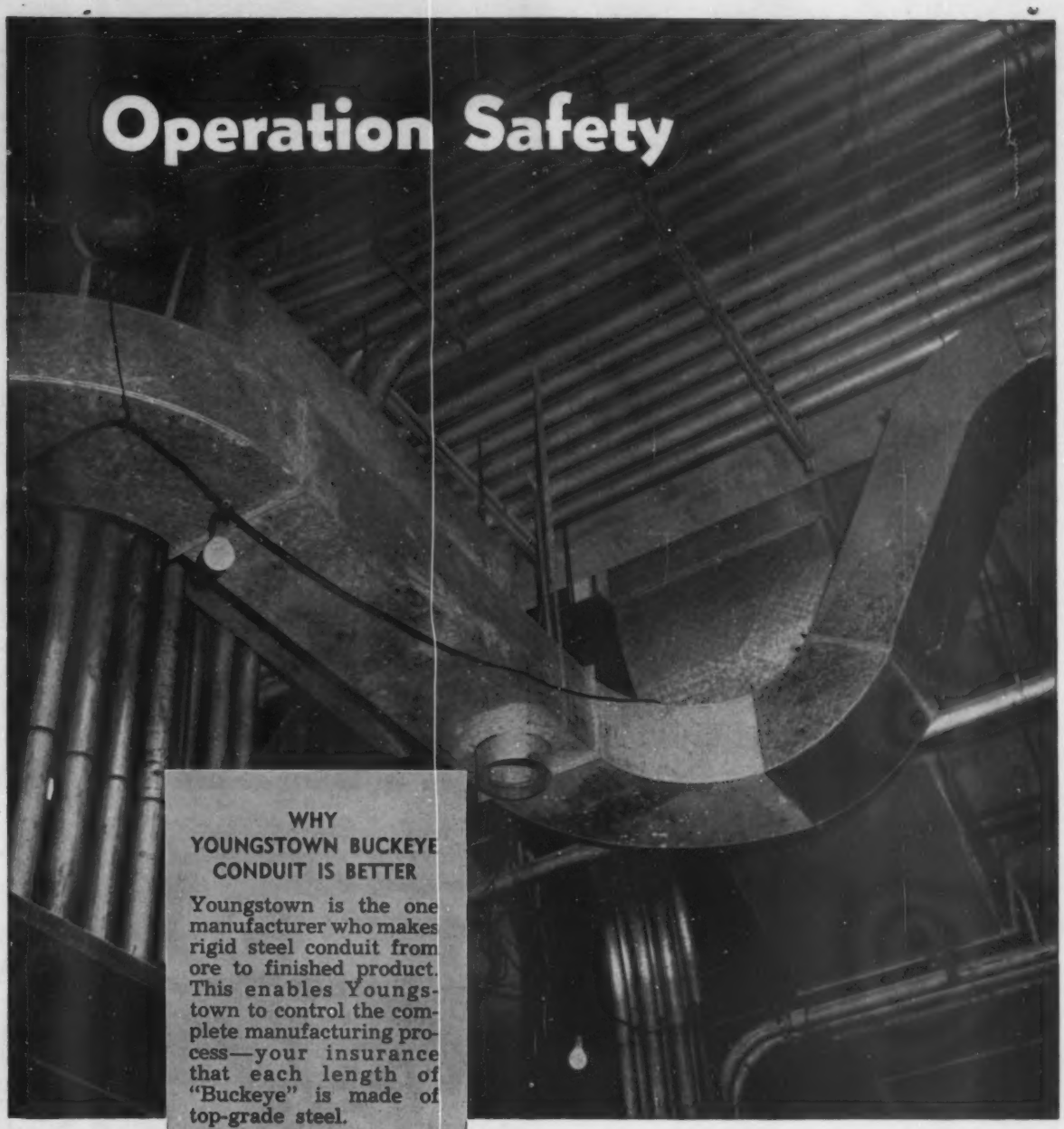

WHY YOUNGSTOWN BUCKEYE CONDUIT IS BETTER

Youngstown is the one manufacturer who makes rigid steel conduit from ore to finished product. This enables Youngstown to control the complete manufacturing process—your insurance that each length of "Buckeye" is made of top-grade steel.

Youngstown

QUALITY V YOUNGSTOWN SERVICE

●Youngstown Buckeye Rigid Steel Conduit is the safe raceway. It is approved by the National Electrical Code for all hazardous locations. In addition it is safe and sure to work with—easy to bend, and erect. Enamel does not chip. Thus Buckeye provides a smooth, continuous raceway for fast, trouble-free running or withdrawal of wires.

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Be sure that you receive
the 16th Annual

ELECTRICAL SOUTH LIGHTING ISSUE

Coming out in October

COMPETENT LIGHTING AUTHORITIES ESTIMATE THAT 2 BILLION DOLLARS WOULD HAVE TO BE SPENT TO BRING LIGHTING IN THE SOUTH UP TO A SATISFACTORY LEVEL.

Findings of the National Lighting Bureau point up the fact that only one out of ten industrial and commercial buildings is lighted to even minimum standards of the Illuminating Engineering Society.

Electrical South's 16th Annual Lighting Issue gives recognition to these facts by presenting in a single issue a symposium designed especially to help you capitalize on the opportunities made possible through the national and local promotion that will result from the National Lighting Bureau's program.

FEATURED IN THIS ISSUE WILL BE AUTHORITATIVE ARTICLES ON —

- **How to lay out a lighting installation that will meet IES standards.**
- **How to sell lighting modernization.**
- **How to use lighting sales promotion materials advantageously.**
- **How to organize local co-operative promotions.**

This important "how to" information will be supplemented with a "Lighting Products Parade" describing and illustrating new lamps, fixtures, and related products; and a special pictorial section presenting some of the outstanding lighting installations in the South completed during the past year.

Be sure that you don't miss this important issue . . .

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If you are not a regular subscriber to Electrical South —take this opportunity to join the ranks of the thousands of successful electrical men throughout the South and Southwest who receive it regularly. For less than 6c a month you can take this valuable "silent partner" into your organization.

Fill out and mail the coupon at left TODAY!

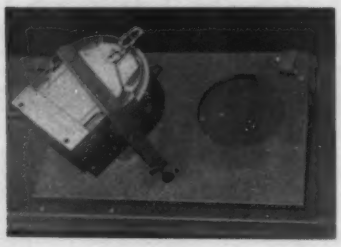
start winding currents up to 50 amperes on 115 volt motors and 35 amperes on 230 volt motors. Magnet coils are available for continuous duty ratings up to 480 volts, 60 cycles or 300 volts, 25 cycles. Relay pull-in voltage is adjusted at the factory for operation within the desired range.

For additional data, circle item 919 on the handy coupon on page 76.

Meter-carrying shelves eliminate damage danger

MORRISON STEEL Products, Inc., 601 Amherst St., Buffalo 7, N. Y., is now offering new meter shelves for use with their Carry-All bodies. The addition of these shelves makes the unit an ideal body for meter installation and service work.

These new meter-carrying accessories can be installed in either the



front vertical compartments as adjustable shelves or three of them can be fitted, side-by-side, in the horizontal compartments located one on each side of the body. A Morrison Carry-All body fully equipped with the new shelves can carry a total of 24 electric meters.

The meters fit into padded recesses in the shelves and are held securely in place by adjustable, flexible straps. Danger of damage to the meters in transit, resulting from carrying them loose in the truck, is eliminated. Both the body and these new accessories are designed for easy loading, unloading and handling of the meters.

For additional data, circle item 920 on the handy coupon on page 76.

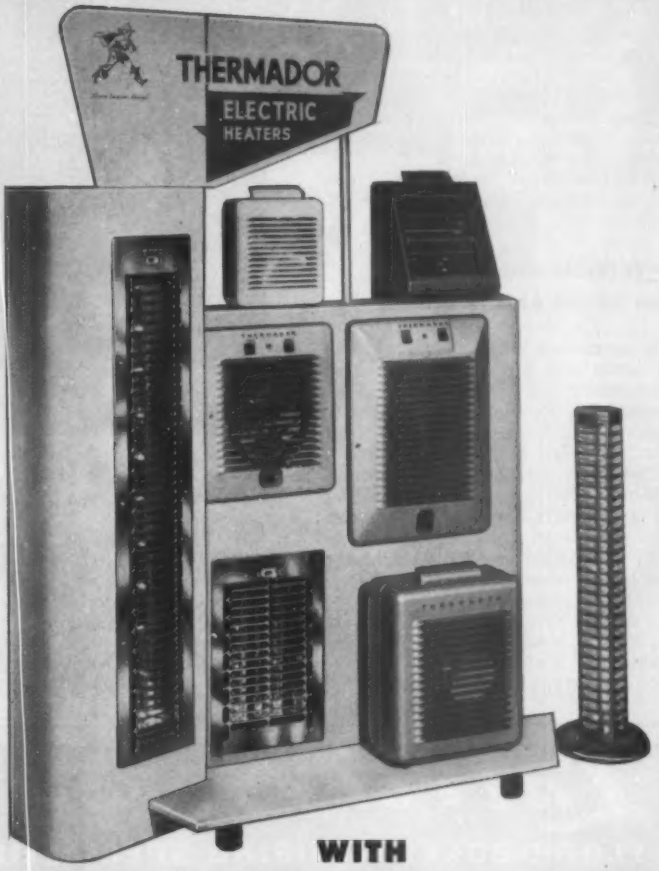
New rapid-start lamp produces higher output

DEVELOPMENT of a new rapid-start fluorescent lamp which produces higher light output than any existing fluorescent lamp type without sacrificing life has been announced by General Electric's Lamp Division, Cleveland, Ohio.

Its high light output contributing to the reduction of initial and maintenance costs, the new lamp is expected to find wide use in industrial, commercial, office and school applications.

Because it operates efficiently at

Cash in! HOT Profits!



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★ **FREE** with your order of one each of Thermador's nine models of Bilt-in and Portable Heaters you receive this attractive, sturdily constructed display.
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Electrical Heaters for Every Need—Ideal for the Southern Market

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Division of Norris-Thermador Corporation

Dept. 3952-ES, 5215 So. Boyle Avenue, Los Angeles 58, Calif.

Or from your nearest Thermador representative:

Atlanta 3, Georgia	H. C. Biglin Co., Inc. 177 Harris St. N.W.	**Kansas City 13, Missouri**	W. H. Faber Co. 6940 Wornall Rd.
St. Louis 8, Missouri	Warren J. Gottemeyer 5095 Waterman Blvd.	**Dallas 16, Texas**	W. E. Tallman 2236 Sutter St.

3-9629

low atmospheric temperatures, the lamp also is expected to prove popular for out-of-doors locations.

The new lamp type will be introduced in the 96-inch length, one and one-half inches in diameter. A 72-inch-long lamp will follow.

The lamp features an entirely new lamp base, which incorporates two recessed contacts in a single element. This provides convenient push-pull lamp insertion without sacrificing safety, according to G-E.

For additional data, circle item 921 on the handy coupon on page 76.

Reversible window fan can be set at any angle

A REVERSIBLE window fan that can be set at any angle for completely draft-free home cooling has been introduced by the Fan Division, International Oil Burner Co., 3800 Park Ave., St. Louis 10, Mo.

The Model RS20 features a special patented swing around mounting which permits focusing of the air stream in any direction from 0° to 180°, providing a gentle circular movement of air and eliminating a direct air blast. The entire fan cabinet can be pivoted from the inward circulating position to the outward exhausting position without removing either the fan unit or the window screen. Both sides of the fan are protected by grilles for maximum safety.

The three 20-inch cloverleaf blades are driven directly by a powerful

1/10 hp two-speed motor, moving 3,500 cfm at high speed, 2,500 cfm at low speed.

The Model RS20 is 22½ inches high and 24 inches wide. Expandable metal wings with no special fittings permit easy installation in windows up to 44 inches wide.

For additional data, circle item 922 on the handy coupon on page 76.

Announce dimmer control for theatrical systems

A NEW MAGNETIC amplifier type dimmer control for theatrical lighting systems has been developed by Vickers Electric Division, Vickers, Inc., 1815 Locust St., St. Louis 3, Mo.

Use of self-saturating magnetic amplifiers in the dimmer eliminates the need for electronic tubes and permits operation on control currents of very small magnitude and at low voltage.

Dimmer response is instantaneous, without warm-up time, and provides smooth transition of light intensity from full brilliance to complete blackout.

The only moving part in the entire dimmer is a miniature pilot potentiometer with which the operator controls dimming. Pilot potentiometers can be located at one or more convenient control stations, remote from the dimmer units, making Vickers dimmers ideal for remote installation when space is at a premium.

Elimination of electronic tubes and their attendant maintenance and service problems, and use of static type components of rugged construction, result in long life and dependable operation of the new dimmer.

The compact dimmer consists of a power reactor assembly, selenium rectifier units, and a self-saturating magnetic amplifier type pre-amplifier with bias circuit elements.

For additional data, circle item 923 on the handy coupon on page 76.

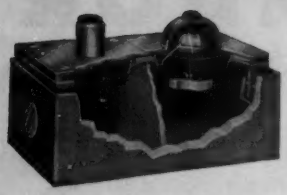
Voltage testing instrument provides variable output

PORTABLE MODEL 421 D. C. Hypot, rated 0-10,000 V.D.C. at 0-500 microamps, is a new addition to Associated Research, Inc., 3758 W. Belmont Ave., Chicago 18, Ill., line of standard D.C. and A.C. Hypots. Applica-

tions include dielectric strength testing of electrical equipment and components, measurement of insulation resistance up to 1000 megohms, and maintenance testing of heavy equipment regardless of capacitance.

Model 421 provides continuously variable output voltage and current, large 4½ inch kilovoltmeter and

Latrobe PRODUCTS
FLOOR BOXES • WIRING SPECIALTIES



No. 252-R Two Gang Adjustable Floor Box

"Latrobe" Floor Boxes and Wiring Specialties are designed to do their job easily and surely with no excess parts. This same compactness of design makes for fast, easy installations.

Floor Boxes • Cover Plates • Pipe or Conduit Hangers • Gang Boxes • Nozzles • Fish Wire • Cable Supports • Junction Boxes • Insulator Supports • Staples and Cable Clips

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CASTINGS • FABRICATED PARTS
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NEW TANK SIZE:
4 ft. Wide
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*Items up to 45 feet long accommodated by double dipping.

YOUR parts or products can have the same high-quality hot-dip galvanizing used on our own Dixisteel products. Small, tight spangles . . . smooth, uniformly-heavy coats of zinc . . . no fins! A tough, lasting armor that stands guard against rust and corrosion.

Write or phone for quotations on this superior service. Please give full details about materials, including all dimensions.

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If it's exposed to rust . . . Galvanize it!

FABRICATING DIVISION

Atlantic Steel Company

MAKERS OF DIXISTEEL SINCE 1901

ATLANTA, GEORGIA • EMERSON 3441

Elgo Ventilating Specialties

Extraordinary Automatic Shutter

You'll like the "Elgo" because of its exceptionally snug fit which keeps out rain, snow and insect pests. And you'll like it because it is exceptionally sensitive to air currents, offering less resistance to fan pressure. Sizes from 12" to 72" square—also rectangular.

Write for circular and prices

"Echo" Automatic Ceiling Shutters

Used for attic ventilation. Installed in attic floor at the base of a penthouse, the louvers being operated by the suction of the fan.

Free CATALOG

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ONLY ELECTROMODE ALL ELECTRIC HEATERS have all **3**

Triple Assurance With . . .

A Combination That Can't Be Beat for HOME • OFFICE • FACTORY

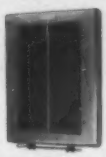
MORE PROFIT FOR YOU

- √ Quick, easy to install
- √ Minimum maintenance
- √ 100% efficient
- √ Automatic control
- √ Clean, fan-circulated heat
- √ User satisfaction

MODEL WJA

Everybody wants a toasty-warm, good-looking bathroom. The Electromode Automatic Wall-Type Bathroom Heater is the ideal solution. Choice of gleaming chrome or white enamel finish. 1320 watts.

MODEL WA



Heat big rooms with this modern design Electromode wall model with built-in thermostat for individual room temperature control. Down-flo principle distributes heat at floor level. Silver grey hammertone finish blends with furnishings. Capacities: 1500 to 4000 watts.

MODEL 14-10
Suspension-type Unit Heater

Electromode Unit Heaters in Suspension and Combination Portable and Suspension types solve hard-to-heat areas in the plant and isolated locations.

100% SAFE

Hot resistor wires are insulated and embedded within a finned aluminum casting, assuring positive protection from fire, shock or burn. This finned type element acts as a superior heat diffuser, resulting in greater heating economy.

5 YEAR GUARANTEE

The patented, cast-aluminum heating element is guaranteed for five years against all defects of material or workmanship.

The Famous GE UNIT MOTOR

Totally enclosed construction protects motor from entry of dust. Large supply of oil sufficient for years of motor operation is factory-sealed-in. Forced lubrication system assures long life and quiet operation.

SAFETY SWITCH

Built into every Electromode Heater is a small thermal safety switch, located on or near the heating element. If for any reason the air flow should stop, causing overheating of the element, this safety switch automatically shuts off the current.

Approved by Underwriters' Laboratories

ELECTROMODE CORPORATION
45 CROUCH ST., DEPT. ES-94 ROCHESTER 3, N. Y.

Please send free literature on:
Electromode Heaters ☐ Domestic ☐ Industrial

NAME_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

microammeter individually mounted, and panel-mounted neon lamp to visually indicate flow of excessive leakage current. Welded steel case with removable cover measures 17 inches x 9 inches x 11 inches. Net weight of instrument is 36 lbs. Input is 115 V.A.C. 50-60 cycle. For complete data on D.C. Hypot testing write for Bulletin 14-1.

For additional data, circle item 924 on the handy coupon on page 76.

Switchboards feature design advantages

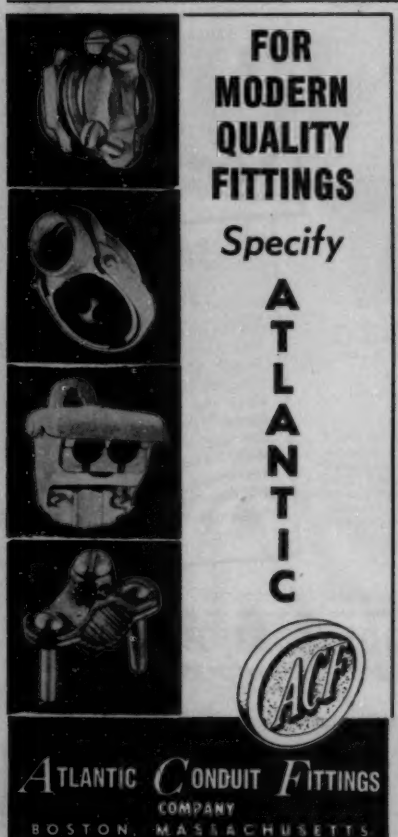
OUTSTANDING DESIGN advantages are features of a complete new line of switchboards for low voltage distribution applications, recently introduced by the Square D Co., 520 N. Michigan Ave., Chicago 11, Ill. An isolated wiring trough provides ample space for laying conductors. Two drop-off openings per section assure neater and safer wiring. Higher short circuit capacity of main bus bars results from edgewise mounting in a unique clamping arrangement. More compact construction and reserve space for future circuits are top features. Flexibility of circuit arrangement is also standard with the new design.

These new switchboards provide standardized sections for branch circuit breakers or switches and standardized sections for main incoming line equipment. The group of sections necessary to handle the various

components are bolted together to form a rigid switchboard assembly. Standardized construction benefits the customer directly in reduced delivery time and lower installation cost.

Attractive appearance is another outstanding feature. Modern styling matches that of Square D control centers and other related equipment.

For additional data, circle item 925 on the handy coupon on page 76.



New window fan timer shuts off automatically

ATLAS-AIRE has added a fan timer (Model FT20) as an accessory to its 1954 window fan line. The timer automatically turns off the fan at a predetermined time and results in

reduced current costs, longer fan life and increased comfort and convenience to window fan sleepers. Atlas Tool & Mfg. Co., 5147 Natural Bridge Blvd., St. Louis 15, Mo., regards the accessory particularly appropriate for its multiple-purpose Port-About models.

The timer may be used with any fan up to 1/3 hp, 120 volts, 60 cycle a-c. Its cord is plugged into any convenient electrical outlet with the fan cord plugged into the timer. The timer is set at the desired number of hours' operation and the fan automatically shuts off when the time is up. It may be set for any time up to 20 hours.

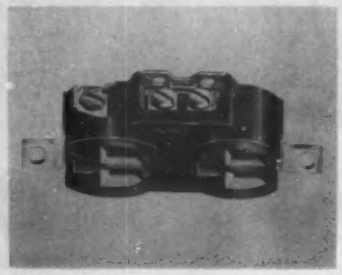
The Model FT20 is small, compact and attractively designed. Its neutral gray and green finish blends inconspicuously with other colors.

For additional data, circle item 926 on the handy coupon on page 76.

Duplex receptacle takes standard caps

A NEWLY-DESIGNED 3-Wire Duplex Receptacle of the grounding type has just been added to the industrial line of the Rodale Manufacturing Co., Inc., of Emmaus, Pennsylvania. 15A, 125V, it takes standard parallel or polarized parallel caps and is adaptable for back or side wiring.

It features a specially-constructed Break-off point on terminals for 2-



circuit installations. In addition, it will accommodate new grounding type U-blade plugs as well as 2 armored or rubber caps. Large binding head screws assure quick, easy wiring, with a hexagonal green screw for the grounding wire.

Completely interchangeable with all other makes, it fits standard duplex plates, and is highly recommended for use in situations where the grounding of exposed metal parts of portable electrical equipment is required. Available as Rodale Cat. No. 572.

For additional data, circle item 927 on the handy coupon on page 76.

Fluorescent ballast has 'D' sound rating

A NEW FLUORESCENT lamp ballast that is lighter, smaller, and quieter than previous models has been announced by the General Electric Company's Ballast Dept., Schenectady 5, N. Y.

Newest feature of the unit is a "D" sound-rating, according to the company's standard for the guidance of fluorescent lighting users. Other

installation factors being equal, the improved rating permits use of the ballast in locations with critical sound-level restrictions, such as schools and hospitals.

A 14 per cent weight reduction in the new design provides substantial savings in shipping costs, G-E engineers said, and a reduction in mounting length allows greater freedom in fixture design.

Designed for series operation of two 96T12 slimline fluorescent lamps at 425 ma, the new ballast is rated at 110-125 volts, 60 cycles, with a line current of 1.55 amps.

For additional data, circle item 928 on the handy coupon on page 76.

Distributor display for bells and buzzers

THE EDWARDS CO., Norwalk, Conn., has introduced a new display panel for use in distributor sample rooms. The panel is white and blue and is 30 inches wide by 18 inches deep.

Manufactured of 3/16-inch composition board, with all equipment mounted and the bells, buzzers and push buttons operating, the panel may be displayed on the counter or hung on the wall.

It is available in limited quantities. Orders may be placed direct with the company or through an Edwards representative.

For additional data, circle item 929 on the handy coupon on page 76.

Secondary capacitor meets growing loads

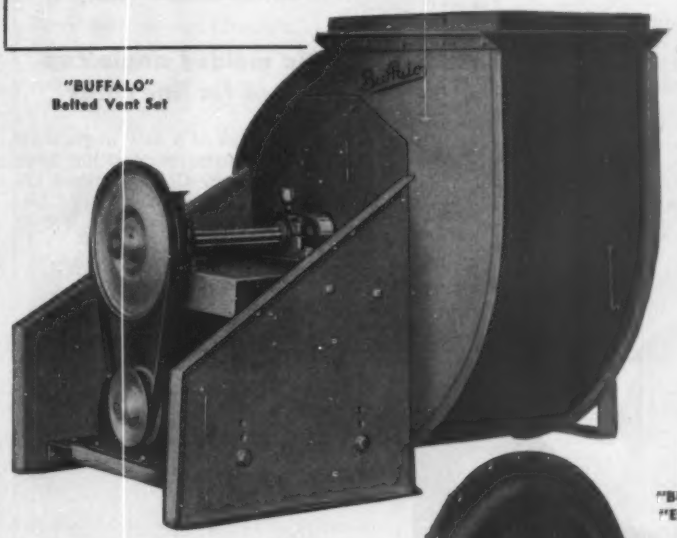
A NEW FIVE-KVAR residential secondary capacitor, designed to assist utilities to meet the rapidly growing loads at decreasing power factor on distribution systems, has been announced by the General Electric Company's Capacitor Department, Hudson Falls, N. Y.

Features of this new residential secondary capacitor, rated five KVAR, 240 volts, single phase, include lower installed cost per KVAR,

long life, a ground stud for easy grounding and a durable triple-coat case finish, provided by two coats of Melaglyp paint over a tin plated drawn steel case. The rectangular,

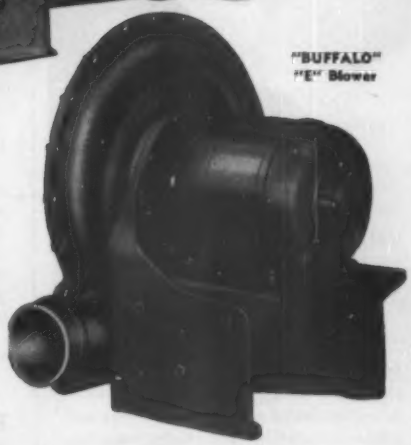
SELL THE FANS THAT HAVE BEEN PLEASING CUSTOMERS for *77 Years*

Since 1877, the name "Buffalo" has stood for good, dependable equipment. Today, you can offer a modern, high-efficiency "Buffalo" Fan for almost any air handling job your customers could call for — from kitchen and attic fans to large ventilation fans and exhausters. Below are two "Buffalo" Fans popular for their easy installation, high delivery and low maintenance costs.



"BUFFALO" Belted Vent Set

"Buffalo" Belted Vent Sets are lightweight, non-overloading package units for quiet ventilation. Removable motor sheaves permit changing capacity any time. 500 to 20,000 cfm capacities. Write for Bulletin 3720.



"BUFFALO" "E" Blower

At right, "Buffalo" "E" Blowers — Exhausters are husky units for blowing small furnaces and forges, cleaning operations, cupola work. Write for Bulletin 3014-C.

BUFFALO FORGE COMPANY

210 Mortimer St. Buffalo, N. Y.

PUBLISHERS OF "FAN ENGINEERING" HANDBOOK

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

Sales Representatives in all Principal Cities

Ventilating Air Cleaning Air Tempering Induced Draft Exhausting
Forced Draft Cooling Heating Pressure Blowing

hermetically sealed, Pyranol filled case, provides the necessary characteristics for expansion due to temperature changes, in addition to reliable fuse co-ordination. The unit can be mounted directly on the pole, or on the crossarms, with the bushings pointing up or down.

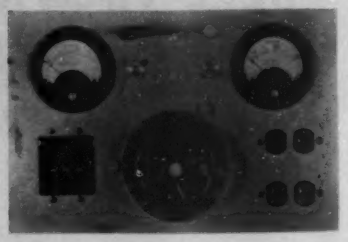
An outgrowth of the growing trend of utilities to take advantage of the benefits of secondary capacitors, the new five-KVAR capacitor, like the company's three-KVAR unit, can be used to improve voltage, reduce losses and release thermal capacity over and above these same benefits obtained from the primary capacitors on the system.

For additional data, circle item 930 on the handy coupon on page 76.

Adjustable power supply for inspection operations

A NEW ADJUSTABLE AC regulated power supply designed to operate from a 60 cycle AC line has been announced by Summit Electronics, Inc., 7 Industrial Place, Summit, N. J. The supply is particularly suitable for application in industrial production and inspection operations as well as in laboratory work.

Several models are available for varying output requirements, ranging from a minimum of 0.1 amperes to a maximum of 100 amperes. Output voltages are readily variable by a simple front panel control, while



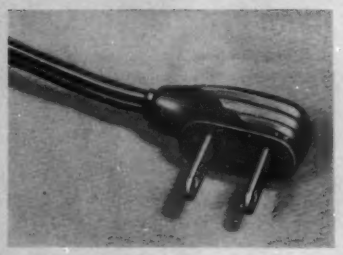
easily read meters make possible rapid adjustment to desired voltage and current.

Intended for rack mounting, the equipment measures 12¼ by 19 by 6⅛ inches. Additional information and prices may be obtained from the manufacturer.

For additional data, circle item 931 on the handy coupon on page 76.

Plastic molded angle cap developed for line cords

DEVELOPMENT of a new angle male cap that is plastic molded has been announced by the Cords Limited Division of the Essex Wire Corp., DeKalb, Ill. Designated as the TM-11



plug, it is engineered and built for use on line cords for appliances, radios, television receivers and small toys.

This new right angle plug complements Cords TM-7 straight plastic male cap that has been in widespread use for some time, and adds to Cords large and comprehensive inventory of standard and special molds for plugs, connections, strain reliefs and grommets.

For additional data, circle item 932 on the handy coupon on page 76.

Elbows added to line of entrance equipment

THE ADDITION of entrance elbows to their line of service entrance equipment was recently announced by the J. A. Weaver Co., St. Louis 6, Mo.

These new elbows are designed to go with Weaver's "Dual-Grip" Entrance Heads, which have a built-in connector clamp for installation on either EMT or rigid conduit, and Weaver's bronze ground clamps which are made in sizes for ¼-inch to four-inch pipe.

Further information may be obtained by writing the company.

For additional data, circle item 933 on the handy coupon on page 76.

Alliance announces garage door opener

ALLIANCE MANUFACTURING CO., Alliance, Ohio, makers of the Alliance Tenna-Rotor and other television products, has announced a dependable, low-priced electric garage door operator.

The Alliance Lift-A-Dor opens and closes overhead type garage doors by merely pushing a button on the auto dash. It also locks and unlocks and turns the light on or off automatically.

For additional data, circle item 934 on the handy coupon on page 76.

Technical books

(*Continued from page 68*)

Electrical Code Diagrams: Revised Editions

By B. Z. Segall, McGraw-Hill Book Co., Inc., 330 West 42nd St., New York 36, N. Y. Two volumes—Volume I, 754 pages, over 1300 illustrations, $13.50; Volume II, 898 pages, over 1800 illustrations, $15.00; $25.00 the set.

Regardless of the branch of electricity you work in—whether as an electrician, electrical engineer, architect or builder—if you design or do wiring you'll find these books one of the most practical means for understanding the National Electrical Code. Every Code rule can be checked, and the meaning made clear, in very short time because the diagrams follow the numbering of the Code exactly. In addition to these easy-to-follow pictures, background material explains the *why* of the Code.

These volumes were first published in a private edition by the author some years ago. Practical men in the field sought them out. The pictorial treatment proved its worth in on-the-job electrical work, in various training programs, and as an ideal means of getting a working understanding of the Code.

Now brought fully in line with the 1953 Code, these two volumes explain all practical chapters of the Code to help you do work in approved fashion.

Mr. Segall, a registered professional engineer, makes his home in New Orleans, and contributes regularly to the pages of ELECTRICAL SOUTH.

One or two bolt holes

Wire sizes Nos. 14 to 1,000,000 CM. One-piece construction—easily installed. Body is well proportioned to withstand excessive use, with ample thread area. Makes tenacious grip on stranded conductors, forcing contact with each wire in strand, thereby insuring utmost in conductivity—bottom of tongue surface is ground. Not susceptible to release under vibration.

Write for dimensions and prices

KRUEGER & HUDEPOHL, INC.
VINE AT THIRD E. S. CINCINNATI 2, OHIO

The Insulation of Electrical Equipment

Edited by Dr. Willis Jackson, John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., 340 pages, $7.75.

This volume covers the subject with direct reference to the design, manufacture, and testing of electrical equipment.

Edited by Dr. Willis Jackson, the new book is the result of lectures at a post-graduate summer session held in the Electrical Engineering Department of London's Imperial College. The twelve authorities who delivered these talks were especially concerned with design limitations and the best means for their removal.

Listed in order, the chapter headings are: "An Historical Survey of the Development of Electrical Insulation" by Willis Jackson; "General Properties of Insulation in Relation to Its Structure" by C. G. Garton; "Permittivity and Dielectric Loss" by L. Hartshorn; "Dielectric Breakdown" by S. Whitehead; "Classification and Review of Insulating Materials" by R. Snadow; "Communication Components" by I. M. Ross; "Power Cables and Capacitors" by L. G. Brazier and R. S. Vincent; "Electrical Machines" by E. Jones; "Power Transformers" by D. Macdonald; "Switchgear" by P. G. Ashley; and "Insulation Testing in the Laboratory, Factory and Field" by J. S. Forrest.

Dr. Jackson, director of research and education with the Metropolitan Vickers Electrical Co., in England, was formerly professor of electrical engineering at the Imperial College.

Atlanta firm named to represent Slater

ANNOUNCEMENT has been made by David Feldman of Slater Electric & Mfg. Co., Inc., Woodside, N. Y., of the appointment of Griffin & Griffin, 931 W. Peachtree St., N. E., Atlanta, Ga., to handle their line of wiring devices.

The Atlanta firm, which will represent Slater in Georgia and Alabama, will carry a complete stock in their warehouse.

Nepo moves to new and larger quarters

ANNOUNCEMENT of their removal to new and larger quarters at 6025 North Keystone Ave., Chicago 30, Ill., has been announced by Nepo Manufacturing Co., maker of mercury vapor lighting equipment, poles and mast arms.

BENJAMIN

HUMIDITY-DEFYING

Textile Lighting Systems

Cut Maintenance and Replacement Costs

Porcelain-Enameled Channels with special provisions for moisture-proof line-wire entrance and conduit suspension, are now available with this new Benjamin "Lite-Line 40" Porcelain Enamel System. Especially designed to combat the excessively moist atmospheres found in textile mills, these units are completely protected against the danger of rust and deterioration due to moisture accumulation.

A virtually unbroken surface of durable Porcelain Enamel covers the channels. There is no place for rust to get a foothold.

Exclusive "Springlox" Lampholders are standard on Benjamin Fluorescent Units.

In locations where a lighting system of individual units is preferred, Benjamin "TX 40" Units meet all the requirements for long-life, trouble-free service in the highly-humid atmospheres found in the textile industry. This one-piece, All-Porcelain Enamel Unit completely protects against rust due to the accumulation of moisture. The one-piece steel construction, by virtue of which the channel becomes an integral part of the housing, makes possible a smooth, unbroken surface of "Life-Time" Porcelain Enamel. There are no cracks or crevices where moisture can collect. Special construction of tapped, cast metal suspension flanges, the same as those found in the "Lite-Line" System, prevents entrance of moisture around conduit stems.

Some Facts about "Springlox" Lampholders

Here are some of the tests which "Springlox" has passed in the Benjamin Development and Testing Laboratory:

(1) Humidity Chamber Test — 1000 hours in 95% humidity at a minimum temperature of 95° F.
(2) Spring and Contact Fatigue Test —8000 simulated lamp changes.
(3) Vibration Test—100 hours at 25 cycles per second.

Get Up-To-Date on Humidity-Defying TEXTILE LIGHTING! Send for LATEST, FREE DATA BULLETIN — Write Benjamin Electric Mfg. Co., Dept. Z-1, Des Plaines, Ill.

Standard Transformer to Peterson Engineering

STANDARD TRANSFORMER CO., Warren, Ohio, announces the appointment of Peterson Engineering, 2000 East 7th Place, Tulsa, Okla., as its representative for the State of Oklahoma.

V. H. Peterson, head of this agency, is a graduate electrical engineer and was formerly connected with the Southwest Electric Co., Inc., of Tulsa.

Peterson Engineering will handle the complete line of Standard transformers—oil immersed, Askarel filled, and dry types, as well as instrument transformers, street lighting and special testing types.

Capacitor switches

(*Continued from page* 42)

years, but it is only recently that large shunt capacitor banks have been extensively applied to power systems at primary voltages.

The authors were D. C. Prince, of Schenectady, N. Y. and P. Wildi, W. H. Clagett and J. Gregg, of the Pacific Oerlikon Co., Tacoma, Wash.

Title of their paper was "A New 115-KV Stored-Energy Type Capacitor Switch."

"Such applications have given rise to a requirement for satisfactory high voltage switching systems at minimum cost," they said. "Up until the present time the power system engineer has had but little choice of equipment other than the standard commercially available power circuit breakers for his capacitor switching applications." These breakers were designed fundamentally for the relatively infrequent interruption of system fault currents, but often not for interruption of capacitive currents, and were so costly as to restrict the economic feasibility of many potential applications.

A capacitor switch, they said "should be designed to function satisfactorily when subjected to a very large number of routine switching operations, possibly several a day, without frequent maintenance periods; may be designed with relatively low fault-interrupting capacity, as fault protection is usually obtained by individual capacitor fuses and station bus differential; and should be designed for minimum cost to extend the range of economic feasibility of shunt capacitor installations at transmission voltages.

"Field tests on a prototype of such a switch have now been successfully performed," they said. "These tests proved, without question, that a completely restrike-free design has been accomplished, through the application of the stored-energy principle of arc extinction, wherein the energy required to force the insulating fluid through the arc path is stored mechanically and is instantly available the moment the breaker is tripped.

"In addition, through a reduction in the continuous current rating to a value commensurate with the shunt capacitor rating, reduction in the interrupting capacity to an inherent minimum, and elimination of the reclosing feature and high speed operation, the special capacitor switch is made considerably more economical than a power circuit breaker of the same voltage class."

Watthour meter tests

(*Continued from page* 41)

troller may be triggered by the phototube associated with the standard watthour meter, in which case the run consists of a predetermined number of complete revolutions of the standard. The potential circuit of the watthour meter under test is closed at the beginning of the run and opened at the end of the run by relays operated by the controller.

Start errors eliminated

When this method is used, the duration of the run is made sufficiently long to render negligible any start-stop errors in the watthour meter under test. The relays which close and open the potential circuit are carefully adjusted to eliminate errors due to unequal lag times in their operation.

In addition to the standard watthour meter, three comparison standard watthour meters are kept in a temperature-controlled cabinet and used to check the reference standard as often as desired. These meters, too, have been chosen for their good stability and have their registers removed to reduce friction. A check of this sort can be made in a few minutes.

The standardization of watthour meters by this method eliminates the necessity of measuring power accurately and holding power constant for an accurately measured time interval, because in the rate-comparison method moderate fluctuations in power affect both the watthour meter under test and the standard in the same way.

Precise results are assured by calibrating and operating all meters at rated load, by reducing friction in the standard meter through removal of their gear trains, by maintaining all standards at a constant temperature, and by energizing the standard watthour meter continuously during tests, thereby eliminating starting and stopping errors in this meter.

Old method retained

This comparison method of testing the rate of watthour meters has superseded the primary method based on the electrodynamic wattmeter because of the rapidity of operation and convenience without significant loss in accuracy. The latter method, of course, must still be used occasionally to verify the accuracy of the standard watthour meter.

Infrequent primary calibrations at regular intervals, and more frequent intercomparison of standards, permit the standard watthour meter to be used with assurance. Supplementary instrument transformers, especially calibrated for use with the standard watthour

meter, serve conveniently to cover the wide range of energy measurement over which tests are requested.

Textile modernization

(*Continued from page* 36)

one for each phase. Where the load is not large enough to split up like this, we endeavor to balance the load with other areas served by the same circuit and by doing so have been able to keep our voltages from becoming appreciably unbalanced due to lighting load. In some of our plants where our supply voltage has been found to vary a good bit, we have installed voltage regulators on our lighting circuits.

Motorization of drives

In modernizing the electrical application, we have placed individual motors on the equipment such as spinning frames, looms, twisters, slubbers, speeders and some new card installations. The old friction drive on our slashers is practically a thing of the past. Here the multi-motor type slasher drives have taken over and are giving a good account of themselves. Most of our slasher drives are the Rototrol or Amplidyne type. However our latest installation uses the magnetic amplifier control which, so far has proven itself very satisfactory.

One of our spinning rooms that had always been driven by the familiar four frame drives, presented the problem of space limitation to the application of individual motors. It seemed as though the room had been designed for these particular spinning frames and the necessary aisle spaces that we had. The aisles were too narrow to put the motors in as we had done with all the other spinning room installations, so we jacked the frames up about two inches and put the motors under the frames. Some of these frames have been in operation about two years now and have been trouble free.

Electronic applications

Instrumentation and electronics are becoming more important factors in textile manufacturing every day. Such things as slasher instrumentation for the detection, recording, and in many cases the automatic control, of moisture content in the yarn are enabling the textile people to do a better job of weaving and thereby offer the

"We like the EASY-TO-SEE SAFETY of B+C boxes"—

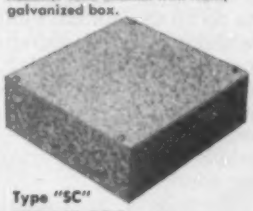
Say Leading Construction and Maintenance Engineers

B-C RUGGED CONSTRUCTION

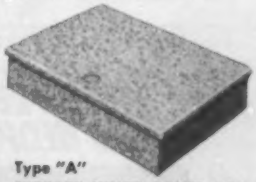
in a type and size to fit every junction or pull box need

For uniform quality, easy workability and long-lasting construction, B&C Telephone Cabinets, Junction and Pull Boxes have proved themselves *a good investment* wherever installed. Every cabinet and box in the large and complete B&C line is constructed in strict compliance with the Underwriters Laboratories Specifications and the National Electrical Code. Only the finest steels are used.

Type "PF"
TELEPHONE CABINET *(above)*
Flush mounting. Hard grey hammer-tone enamel trim front, galvanized box.



Type "SC"
SURFACE BOX
Screw cover. Hard light grey enamel finish, or galvanized.



Type "A"
SURFACE HINGE COVER BOX
Same general specifications as Type "SC" above.

Write for complete catalog data and specifications . . .

UL and B-C

Your Seals of Dependability and Safety

METAL STAMPING CO.

590 MEANS ST., N. W., ATLANTA, GEORGIA

public a higher quality fabric.

The application of instrumentation to process control is proving itself a valuable aid in dying, size cooking, moisture control and the like. In the laboratory, electronic machines are doing a good job testing sliver, roving and yarn for evenness. In the cloth finishing departments electronically controlled apparatus such as bow and weft straighteners are becoming integrated parts of the finishing ranges.

All of these electronic machines, in conjunction with other modern electrical applications, are helping the textile industry in its endless drive to produce a better quality product at a lower cost. We are aware of the ever increasing use of electrical power throughout our mills and therefore keep a sharp lookout for new equipment and new methods which will enable us to keep our plants electrically modern.

Electrical office heating

(*Continued from page* 31)

cooling, minimum utilization of heat gain from lights in winter, and minimum amount of intake and exhaust vents and connecting ductwork.

No subcontractor needed

Because he has his own sheet metal shop, Mr. Compton was able to do all the Mutual building work without using a subcontractor. He has been in business for himself for 12 years and handles electric motor repairs, commercial refrigeration, electrical repairs and maintenance, commercial and home air conditioning.

Prediction in Decatur is that before the end of the 1954 cooling season rolls around the town will be 100 per cent air conditioned except for homes, and Rowland J. Compton can claim his share for this through his aggressive merchandising of air conditioning of which the Mutual Life Building is a primary example.

Terminating techniques

(*Continued from page* 28)

In 1927, Alcoa established at Massena, New York, an aluminum conductor laboratory, now the Electrical Engineering Division of Aluminum Research Laboratories. This laboratory has recently developed methods for evaluating various type of connections involving aluminum conductors, and aluminum-to-copper conductors.

A major portion of the research program is devoted to the study of the connectibility problem with respect to aluminum. Out of this work has come the heat cycle test in which lengths of conductors are terminated by various methods, bolted back to back in series, and then subjected to alternate cycles of current and cooling.

For example, a 500,000 circular mil aluminum cable with RH insulation would be subjected to a current of 536 amperes for a period of perhaps 4 hours, and then allowed to cool to room temperature. Connectors terminating such a cable might be subjected to as many as 600 or 700 such duty cycles. During this type of accelerated test, temperatures are recorded continuously and resistance measurements taken periodically. From data obtained in these tests, fairly accurate predictions can be made concerning the performance of connectors of similar design.

Alcoa has carried out extensive tests on connectors manufactured by various fittings manufacturers and has made data available to each of the manufacturers on their own fittings. As a result of this test work, there are now a number of commercial fittings which carry Underwriter's Laboratories listings for use on aluminum conductors and which will perform satisfactorily for very heavy duty use.

The following bibliography lists some current information available on aluminum conductors.

REFERENCES

"Voltage Drop Charts for Selecting Insulated Aluminum Cable," F. A. Gunther, Aluminum Company of America, *Electrical World*, Sept. 13, 1947.

"Electrical Innovations in the Alcoa Building," L. N. Grier, Aluminum Company of America, AIEE Conference Paper—Winter General Meeting, 1953.

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(Note: Materials listed by Alcoa personnel are available from: Aluminum Company of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.)

Binding contracts

(*Continued from page* 25)

tractor is not necessarily bound to so perform as to comply with the prime contractor's obligations to the owner. (Of course, this assumes that the subcontract is not so worded as to make the terms of

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the prime contract binding upon him.)

Defendant, prime contractor, contracted with a hotel corporation to install a 100-ton air conditioning system to service the public rooms of the hotel and to install the necessary transformers for that system as well as for 300 ¾ - ton room air conditioners eventually to be installed under a separate contract.

Notification of bidder

Defendant called for bids to install the transformers. Plaintiff, low bidder, like the other bidders bid on installation of three 100-kva transformers, without any representation that they would adequately supply the projected air-conditioning system. Defendant telephoned plaintiff that its bid was accepted and requested that plaintiff proceed. The work was completed in conformity to the terms of the bid.

But the day after the bid was accepted by telephone, defendant sent to plaintiff a letter "confirming" what it called a "verbal order" for the equipment, and stating that the transformers were to be "of adequate size to handle the 100-ton air conditioning system and the 300 ¾-hp single phase room air conditioners." (There was no such requirement stated in the call for bids and no such condition was specified in the bids.)

Part payment made

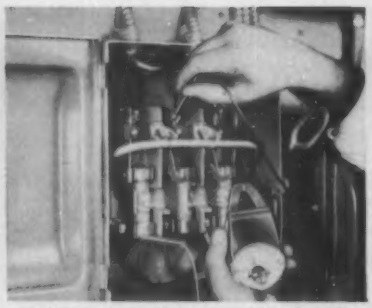
When installation was completed, defendant paid part of the price but refused to pay the balance on the ground that the transformers would not carry the load specified in the defendant's confirmatory letter. Defendant counterclaimed for damages claimed to have resulted from failure to comply with that condition.

The United States District Court for Southern Mississippi dismissed the counterclaim and awarded plaintiff judgment for the balance due. (108 Fed. Supp. 209.)

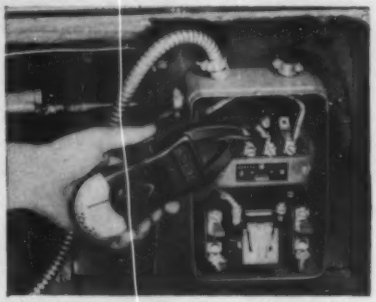
Upholding the decision on appeal, the Court of Appeals decided that there was a completed contract when defendant telephoned its acceptance of the bid and that it was too late for defendant to afterwards attempt to impose a new condition, and thereby "pass on to plaintiff the responsibility of determining the transformer requirements" imposed upon defendant by its contract with owner.

One lesson that the case teaches, from the standpoint of prime con-

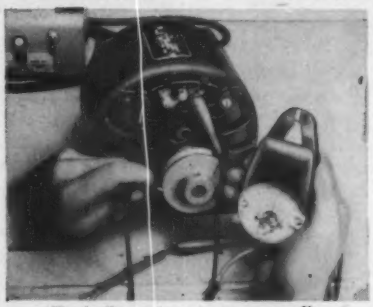
"No shutdowns to take current readings"



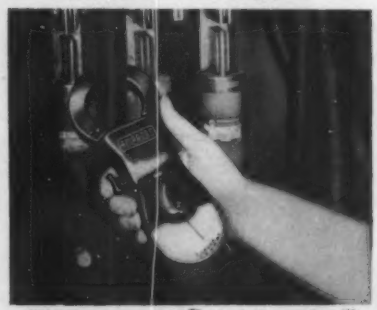
"A real short cut for checking fuses"



"Takes the guesswork out of servicing"



"Periodic motor checks pay off"



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tractors, is that in calling for bids by, or in contracting with, subcontractors, the call for bids or subcontract should be carefully worded with a view to imposing upon the subcontractor the same conditions as are imposed upon the prime contractor by his contract with the owner.

Portable material house

(*Continued from page* 22)

"hip," is also in two sections, each 7 by 8. To seal against weather the fissure remaining after two sections of the roof are in place, Mr. Hall designed a timber strip, hinged in the middle and fitting down over the fissure. Its construction is better understood from an accompanying photograph.

In building the first unit in 1937, and as additional units have been needed through the years, Mr. Hall has had the services and advice of a carpenter who has worked for the firm when needed through the entire period.

Assembly aid

Necessary hinges are located on the inside of the house by the obvious procedure of assembling all the sections in their proper places and "tacking" them together with nails to hold the components rigid. Then hinges are affixed, after which the roof is mounted and additional hinges are located. When the material house is thus completed, identifying paint marks are used so that related sections may be assembled without confusion.

After all the necessary hinges have been set, it is no longer necessary to nail the frame sections together for assembly, but it is necessary, in both assembly and disassembly, to utilize temporary bracing, in the form of perhaps 1 by 4's "tacked" on, to hold certain components in place while other sections are being added or taken away. In erecting or dismantling, the points at which such bracing is necessary will become apparent to the crew as the work progresses.

Minimum maintenance

(*Continued from page* 23)

considerable timesaver.

In a non-industrial area like Washington, the problem of obtaining personnel with industrial wiring experience had to be met right on the job. Taking on maintenance helpers, we do not require electrical experience but diversify a helper's experience during training under Class A electricians so that they acquire an all-round mechanical and electrical skill.

Windowless building

(*Continued from page* 19)

put in after wiring was completed. On the other two floors 500 floor boxes were installed for wall cases and showcases.

Floor duct method

In putting in floor ducts, the J. R. Hime Electric Co. followed a method of its own which it claims is faster, safer and less expensive than other methods it has used. The ducts were mounted on the five-inch concrete floor slab. Holes for the fastening saddles were drilled into the concrete with a Carboloy drill one size smaller than the sheet metal screws used. These screws of hardened steel, put in with a ratchet and screw driver bit, made their own threads. An advantage was that if they were accidently put in the wrong place they could be backed out quickly.

Wiring for lighting was only a part of this somewhat complicated electrical job. The contract included wiring for two telephone systems, one for outside calls and the other an interior credit telephone system, with 300 instruments, and necessary conduit boxes; a store sound system for music and announcements with ten "mike" locations; an electrically-operated carillon bells system; an electronically operated sprinkler system; and an electronic burglar alarm system.

Electric devices used

With the exception of gas for cooking in the third floor restaurant kitchen and in the men's coffee shop on the ground floor, virtually every mechanical device in the store is electrically operated. Electrical equipment includes two passenger elevators, one freight elevator, two escalators; a dumb waiter elevator from the shipping department to other floors; belt conveyors from the shipping department to the "will call" department and from the receiving department to the stock department on the mezzanine. There is also a gravity chute for packages.

Currents from switchboard

There are 1,200 lighting fixtures in the store, including both incandescents and fluorescents, ranging from the flush-type downlights to 4-ft. sq., 8-tube fluorescents with eight 40-watt lamps, of which 77 are on the ground floor. Flush-type fixtures of 300 watts are also used on the first floor. The lighting arrangement was carefully planned to obtain both uniform and effective lighting as well as decorative effects. Indirect cove lighting surrounds the first floor sales area. There has also been effective use of recessed display boxes in the walls.

Distribution lighting circuits from the switchboard through panels on each floor is by means of 3 and 3½-inch conduits containing twelve 500,000 circular mil RH wires.

On the entire job the J. R. Hime Electric Co. employed an average of 40 men eight hours a day for four and a half months. Work was under the direction of Frank P. Pileggi, shop superintendent.

The electrical layout was designed by Edward E. Ashley of New York, consulting engineer, who collaborated with the architects, Robert Law Weed & Associates, Miami. The new store had its official opening at the end of July.

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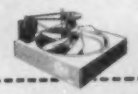

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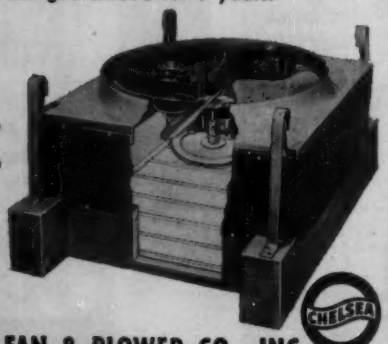

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